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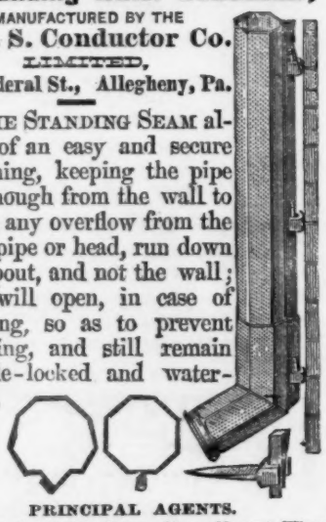

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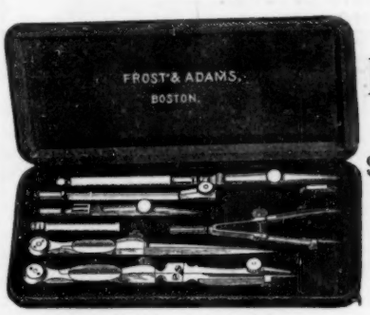

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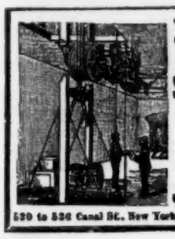

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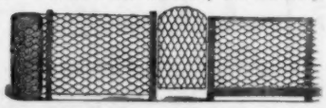

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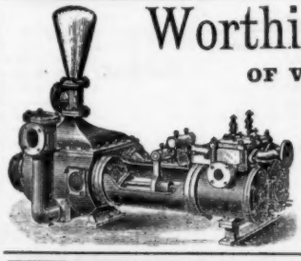

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Cash Capital	$1,000,000.00
Reserve for Re-insurance	635,741.16
Reserve for all other Liabilities,	96,655.57
Net Surplus	832,744.56
Total Assets, January 1, 1883	2,565,141.29

BUILDING MATERIALS.

Reported for the American Architect and Building News.

BRICK. — ℔ M.	New York. (*Wholesale Prices.*)	Boston.	Chicago. (*Prices to Builders and Contractors.*)	Philadelphia.
Common: *Cargo afloat.*				
Pale	$2 25 @ $3 50	Eastern 7 50 @ 8 50	Building Brick 7 50 @ 8 00	Hard 8 00 @ 8 50
Jersey	4 50 @ 5 25			
Long Island		Bay State Hard 9 00	Sewer Brick	Salmon 5 00 @ 6 00
Up River	5 00 @ 5 75	Domestic Com. 8 00 @ 9 00	Indiana Pressd 16 00 @ 28 00	Stretchers 11 00 @ 14 00
Haverstraw Bay	5 75 @ 6 00	Domestic Face @ 18 00	St. Louis Fronts 25 00 @ 35 00	Pressed 20 00 @ 24 00
" 1st	6 00 @ 6 50			
Fronts:				
Croton, Brown	13 @ 14 00	Philadelphia 43 00 @ 45 00	———	———
" dark	14 @ 15 00		———	———
" red	14 @ 15 00	Phila. mould 50 00 @ 80 00	———	———
Chicago pressed			22 00 @ 35 00	———
Chicago Moulded			65 00 @ 350 00	
Baltimore	37 @ 41 00		50 00 @	———
Glens Falls — white	30 @ 35 00	Glens Falls 25 00 @ 26 00	———	———
Philadelphia	@ 27 00		42 00 @	———
Trenton	@ 27 00		40 00 @	———
Milwaukee		Glens Falls Mould.	25 00 @	———
Moulded:			60 00 @ 100 00	———
Clark's Glens Falls — Red	25 00 @ 27 00	30 00 @ 35 00	30 @	———
" — White	30 00 @ 35 00	35 00 @ 40 00	35 @	———
" Mold, — Red or White	45 00 @ 60 00	45 00 @ 60 00	53 @ 65	
Enamelled: *Imp.*				
Enamelled (edge.)	85 00 @ 100 00	@	@ 100 00	Dom. @ 70
Enamelled (edge and end)	90 00 @ 115 00	@	@ 125 00	@ 85
CEMENT, LIME, etc.—(℔ *cask.*)				
Chicago Lime in bulk			65 @ 75	
Wisconsin "			80 @ 90	
Rosendale Cement	95 @ 1 10	1 60 @ 1 50	*Not Sold.*	1 35 @ 1 75
Utica, Akron, Buffalo, Louisville, Milwaukee	*Not sold.*	*Not sold.*	1 00 @ 1 25	*Not sold.*
Portland (American)	2 60 @ 3 10	@ 3 50	2 75 @ 3 00	2 80 @ 3 50
" (Saylor's Am.)	2 05 @ 2 40	2 50 @ 3 00	2 75 @ 3 00	2 50 @ 3 00
" (Dyckerhoff)	2 75 @ 3 15	3 00 @ 3 50	3 25 @ 3 75	3 00 @ 3 25
" (Lafarge)	3 50 @ 3 75	*Not sold.*	3 75 @ 4 25	4 50 @
" (Star)	2 75 @ 3 00	*Not sold.*	*Not sold.*	*Not sold.*
K. B. & S. (Eng.) Portland	2 85 @ 3 10		3 35 @ 3 50	3 00 @ 3 25
Burham " "	2 60 @ 2 80		3 15 @ 3 35	2 75 @ 3 00
Vorwohler	2 65 @ 3 25		3 00 @ 3 25	
German (Fewer)	2 50 @ 2 70			
" (Alsen)	2 50 @ 2 80	3 00 @ 3 50	3 15 @ 3 35	2 90 @ 3 25
Selenitic		1 65	*Not sold.*	
Hydraulic Lime of Teil	3 50 @ 4 00		*Not sold.*	
Roman	2 75 @ 3 00	3 50 @ 4 00	2 75 @ 3 25	3 25 @ 3 50
Keene's coarse	5 00 @ 6 00	7 50 @ 9 00	7 50 @ 9 00	6 50 @ 7 00
" fine	9 25 @ 10 25	11 00 @ 12 50	11 00 @ 12 50	11 50 @ 12 00
Lime:				
Rockland and Rockport, (Com.)	@ 95	1 10 @ 1 15	*Not sold.*	1 00 @ 1 25
Rockland and Rockport, finish	@ 1 10		*Not sold.*	
State, com. cargo rates (nom.)	75 @ 80	*Not sold.*	*Not sold.*	*Not sold.*
State, finishing "	@ 1 00	*Not sold.*	*Not sold.*	*Not sold.*
Canaan, Conn	—— @ ——		*Not sold.*	
Glens Falls (State.)	—— @ ——		*Not sold.*	
Plaster of Paris (calcined.)	1 30 @ 1 35	1 75 @	@ 1 75	1 60 @ 2 25
" (casting)	1 50 @ 1 65	@ 1 90	@ 2 00	2 25 @ 2 50
Hair (Cattle) ℔ *bush*	25 @ 28	20 @ 25	30 @ 35	25 @ 33
" (Goat)	32 @ 35		35 @ 40	@
Sand, ℔ *load*	1 00 @ 1 25	1 00 @ 1 50	100 @ 1 25	75 @ 1 50
STONE. (℔ *cubic foot, rough.*)				
Granite: (*Maine*)		60 @ 1 00		
Limestone:				
Bedford	@ 1 00	——	50 @	3 75 @
Joliet	@		35 @ 55	
Lemont	@	@ 1 00	35 @ 60	
Serpentine	@	——	80 @ 90	

(*Continued on page vi.*)

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Foundation:				
Dimension	@	5 00 @ 6 00	20 @ 28	30 @ 5 00
Block	@	@ 5 00	8 50 ℔ cord.	50 @ 6 00
Rubble	@	@ 1 75 ℔ perch.	8 50 @	
Bluestone: (℔ *sq. ft.*)				
Sidewr'k	30 @ 5 00	30 @	75 @ 1 00	70 @ 90
Planed	50 @ 6 00		50 @ 1 00	1 10 @ 1 25
Sandstone,				
Brown	@ 1	@ 1 40	1 50 ℔ cub. ft.	
Amherst	@	@ 1 05	55 @ 65	
Berea	@	@ 1 05	45 @ 55	70 @ 90
Berlin	@ 1	@ 1 05	55 @ 65	
Bay of Fundy	@ 1	@ 1 00	*Not sold.*	
Belleville	@ 1 40	80 @ 1 00	"	
New Brunswick	@ 1 00	@ 90	"	
Caen	@	@ 80	"	
Marble:				
Lee, Mass.	@	1 75 @ 2 00	*Not sold.*	2 00 @ 2 50
Rutland, white	@	50 @ 1 05	3 50 @ 5 00	2 25 @ 2 50
Sutherland Falls	1 25 @ 1 75	1 25 @ 1 75	3 50 @ 5 00	1 50 @ 2 50
Glens Falls, black	@	75 @ 1 00	*Not sold.*	4 00 @ 4 50
Italian, blue-veined	@	40 @ 50	@ 4 40	— @ —
" Sienna	@	75 @ 2 00	*Not sold.*	3 25 @ 6 50
Tennessee, red	@	75 @ 2 00	@ 4 00	2 00 @ 3 00
" Knoxville	@	50 @ 60	@ 4 00	@ 1 50
Pennsylvania, blue	@		*Not sold.*	2 23 @ 2 50
Vermont, white	@	1 50 @ 2 00	3 50 @ 5	
Slate:				
Roofing, (℔ *square*)	7 00 @ 8 00	4 50 @ 7 00	6 25 @ 8 10	@ 7 00
" green	7 00 @ 8 50	4 50 @ 7 00	@ 8 60	@ 7 00
" purple	@ 15 00	12 00 @ 13 00	— @ 16 00	5 00 @ 5 75
" red	— @ —	*Not sold.*	7 20 @ 7 60	5 00 @ 5 75
" black, Lehigh	— @ —	*Not sold.*	7 30 @ 8 00	6 00 @ 6 25
" " Chapmans	@		*Not sold.*	@ 15 00
Tiles, Am. ℔ M.				
LUMBER.—℔ M. (*Ordinary dimensions.*)				
Boards:				
Pine, 1st quality, clear	65 00 @ 75 00	53 00 @ 54 00	47 00 @ 49 00	
" 2d quality	55 00 @ 60 00	45 00 @ 48 00	42 00 @ 47 00	
" 3d quality	18 00 @ 22 00	38 00 @ 42 00	41 00 @ 45 00	
Spruce	@ 25 00	14 00 @ 17 00	*Not sold.*	
Hemlock	ea. 17 @ 18	11 00 @ 13 50	@ 10 00	12 50 @ 15 00
Yellow pine	20 @ 40	32 00 @ 36 00	@ 28 00	16 00 @ 18 50
Clapboards:				
Pine	@	35 00 @ 45 00	14 00 @ 22 00	— @ —
Spruce	@	26 00 @ 30 00	*Not sold.*	— @ —
Framing Timber:				
Pine		30 00 @ 40 00	13 00 @ 15 50	25 00 @ 35 00
Spruce	14 00 @ 18 00	13 00 @ 16 50	*Not sold.*	20 00 @ 22 00
Hemlock	12 00 @ 15 00	8 00 @ 15 00	13 00 @ 19 00	12 50 @ 14 00
Yellow pine	20 00 @ 30 00	25 00 @ 32 00		24 00 @ 26 00
Laths:				
Pine	@	@ 3 00	2 25 @	— @ —
Spruce	1 90 @ 2 00	@ 2 50	*Not sold.*	3 00 @ 3 25
Shingles:				
Pine, shaved	5 00 @ 6 00	5 00 @ 7 00	*Not sold.*	
Pine, sawed	4 00 @ 5 50	4 25 @ 5 00	2 25 @ 2 60	
Spruce, sawed	2 50 @ 2 75	1 50 @ 1 75	*Not sold.*	
Redwood	2 10 @	4 00 @ 7 00	5 50 @ 8 00	30" $10 @ 28
Cedar, split	@	2 50 @ 5 50	*Not sold.*	24" 8 @ 21
Cedar, sawed	@	@ 3 75	@ 2 30	20" 5 50 @ 14
Cypress 7 x 24	18 00 @ 20 00		*Not sold.*	18 00 @ 20 00
Miscellaneous:				
Piles ℔ ft.	4½ @ 6	Piles 6c. ℔ ft.	*Not sold.*	
Fence pickets, Spruce	8 00 @ 10 00		Pine, 8 @ 22	80 @ 1 50
Cedar posts, 9 ft. (sq. posts.)	@		9 00 @ 21 00	70 @ 1 25
Chestnut	@		*Not sold.*	35 @ 40
Finishing Woods: ℔ M. (*First Quality, Kiln-dried.*)				
Ash	@ 55 00	38 00 @ 42 00	35 00 @	
Cherry	80 00 @ 120 00	60 00 @ 70 00	75 00 @ 85 00	55 00 @ 65 00
Chestnut	@ 55 00	38 00 @ 42 00	45 00 @ 50 00	60 00 @ 80 00
Butternut	40 00 @ 60 00	60 00 @ 70 00	45 00 @ 60 00	55 00 @ 65 00
Mahogany, Baywood	@ 180 00	100 00 @ 150 00	@ 180 00	100 00 @
" St. Domingo	@ 350 00	180 00 @ 250 00	250 00 @ 300 00	
Maple	45 00 @ 50 00	40 00 @ 45 00	30 00 @ 35 00	30 00 @ 50 00
Oak, red	@ 70 00	30 00 @ 35 00	35 00 @ 40 00	35 00 @ 45 00
" white	@ 70 00	38 00 @ 42 00	35 00 @ 40 00	55 00 @ 65 00
" quartered	@ 90 00	55 00 @ 60 00	50 00 @	70 00 @ 80 00
Pine, clear	65 00 @ 70 00	45 00 @ 55 00	45 00 @ 50 00	65 00 @ 90 00
Redwood	70 00 @ 75 00	60 00 @ 70 00	60 00 @ 70 00	100 00 @
Rosewood ℔ lb.	@ 6		@ 7	
Walnut, black	125 00 @ 150 00	90 00 @ 120 00	85 00 @ 100 00	160 00 @ 200 00
Whitewood	45 00 @ 50 00	35 00 @ 38 00	32 00 @ 35 00	20 00 @ 30 00
Yellow pine ℔ M	@ 45 00	32 00 @ 36 00	32 00 @ 35 00	30 00 @ 35 00
Gumwood, best red		60 00 @ 70 00	30 00 @ 35 00	
PAINTS. (*In oil, ℔ lb.*)				
White lead, Am.	6½ @ 6¾	6 @ 6½	6½ @ 6½	4 @ 6½
" Zinc, "	5 @ 8½	11 @ 12	07 @ 11	4 @ 8
Red, Am.,	6 @ 6½	@ 12	*Not sold.*	
" Venetian	6 @ 10½	10 @ 12	1½ @ 2½	4 @ 6½
" Vermilion	55 @ 60	12 @ 20	50 @ 75	Am. 12 @ 16
Red Indian, Eng.	12 @ 20	13 @ 20	12 @ 20	12 @ 16
Yellow Ochre	6 @ 15	11 @ 12	3 @ 15	4 @ 9
" Chrome	12 @ 20	18 @ 25	12 @ 25	12 @ 25
Green (chrome)	8 @ 13	@ 18	8 @ 20	9 @ 14
Green, Paris,	16 @ 20	8 @ 12	16 @ 35	14 @ 29
Black, lamp,	8 @ 12	18 @ 20	8 @ 30	12 @ 18
Blue, ultramarine	12 @ 18	@ 28	10 @ 35	20 @ 35
Oil, linseed, (raw) (℔ gal.)	54 @ 57	54 @ 56	57 @ 60	56 @ 60
" " boiled (℔ gal.)	59 @ 60	59 @ 61	60 @ 62	59 @ 63
Turpentine (℔ gal.)	30 @ 32	@ 38	35 @ 38	38 @ 41
Varnish, coach (℔ gal.)	@	2 00 @ 6 50	1 25 @ 2 00	1 40 @ 4 00
Shellac (℔ gal.)	@		3 25 @ 4 00	1 75 @ 3 00
Putty	2 @ 3	2 @ 3	02 @ 03	2 @ 2½
Whiting (℔ dry)	50 @ 90	@ 3	1 @ 2	½ @ 7-10
Paris white, (Eng.,) (℔ dry)	130 @ 2 00	1 @ 1½	2 @ 2½	1 30 @ 1 60
Litharge, Am. (℔ dry)	5½ @ 5½	2 @ 2½	6½ @ 10	6½ @ 7
Sienna, (burnt) (℔ dry)	12 @ 17½	@ 18	4 @ 16	9 @ 14
Umber, " (℔ dry)	11 @ 16½	@ 17	@ 10	9 @ 14

(*Continued on page* vii.)

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Compressed Lead Sash Weights.

With Wrought and Malleable-Iron fastenings.

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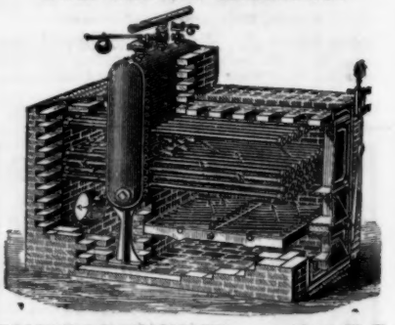

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Sole New York Depot For the Sale of the

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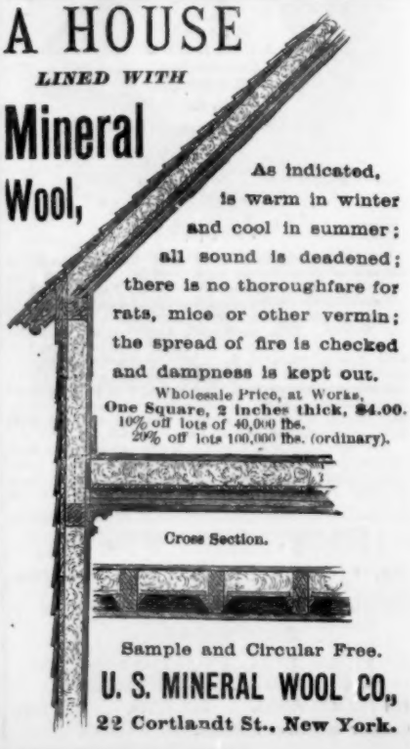

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One Square, 2 inches thick, $4.00.

10% off lots of 40,000 lbs.

20% off lots 100,000 lbs. (ordinary).

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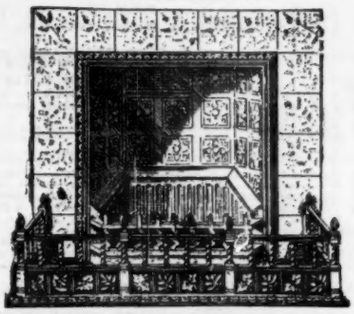

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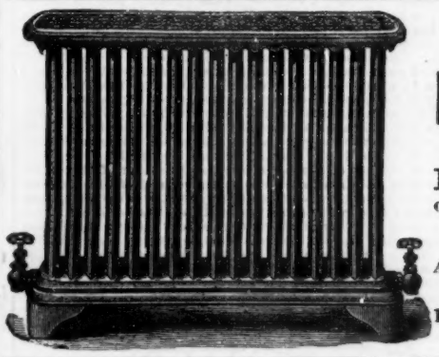

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Saving in fuel fifty per cent over any other system.
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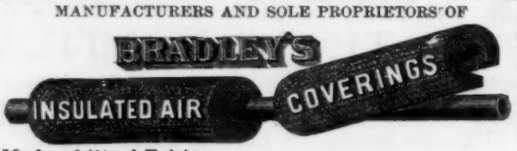

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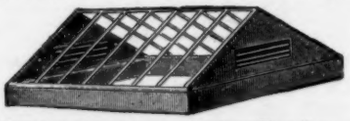

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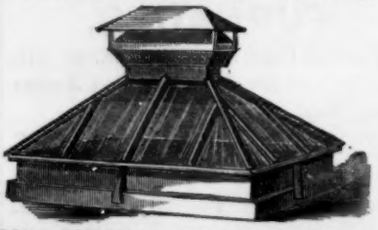

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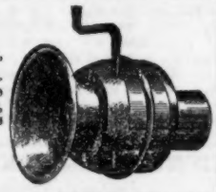

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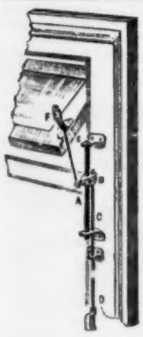

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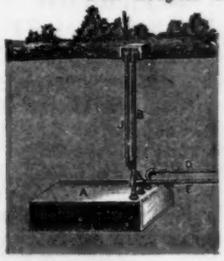

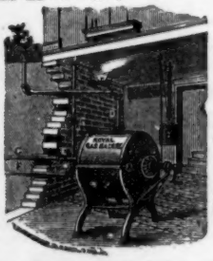

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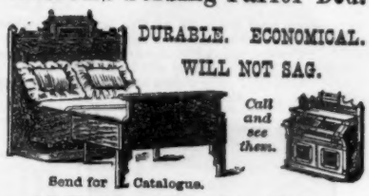

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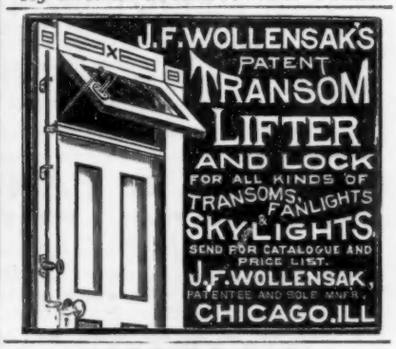

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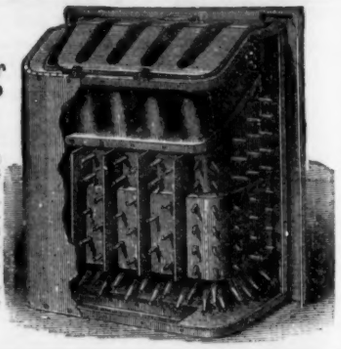

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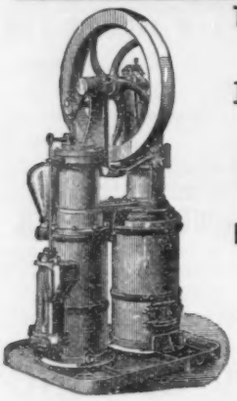

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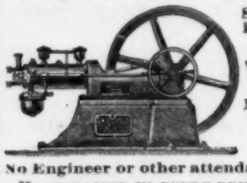

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THE report of the New York Fire-Commissioners for 1883, which has just been presented to the Mayor, contains a good deal of curious information. During the year there were two thousand one hundred and sixty-nine fires in the city, destroying property to the value of something over three and one-half million dollars. The total insurance on the property destroyed or damaged amounted to about twenty-four million dollars; so that the average damage in each case was not more than one-tenth or one-twelfth of the value of the property attacked. This certainly speaks well for the activity and skill of the firemen. It is interesting to learn that less than thirty-nine million gallons of Croton water were used in extinguishing all the fires of the year, so that only about one-thousandth part of the New York water-supply is consumed in extinguishing fires. In regard to the causes of fires, the report says that about fifteen hundred resulted from carelessness; eighty were chargeable to "defective flues"; and six to "maliciousness"; while incendiaries caused only twenty. One hundred and twenty-one are said to have been due to "mischievousness," in distinction from "carelessness" and "maliciousness," as well as from incendiarism. There is something attractive in these nice moral comparisons of the motives of the persons who caused the fires, but a more material view of the subject, taking into account the physical means, such as matches, oily rags, bad kerosene, and so on, by which the effects were produced, might perhaps have been quite as suitable to the occasion.

A PART of the time of the firemen was employed in preparing a census of the buildings in the city, and it was ascertained that New York contained at the close of the year one hundred and one thousand, seven hundred and thirty-five separate buildings of all kinds. Of structures built, as the report says, "exclusively of brick, stone, iron, or other non-inflammable material," there were one hundred and thirty-six. Forty-seven of these are described as "dwellings," from which we suppose that the list must include those so-called "fire-proof" structures in which the floors and fittings are of wood, since dwelling-houses with stone floors are as yet unknown in New York. Nine thousand, seven hundred and ten "business buildings," or more than three-eighths of the whole number in the city, are constructed "exclusively of wood or other inflammable material,"—whatever the other "inflammable material" may be. Of dwellings, seventeen thousand, six hundred and fifteen are of wood. The home-loving people of Philadelphia and Baltimore will be shocked to learn that only about forty-nine thousand buildings in all New York are used exclusively for dwellings, twenty-nine thousand being used partly for business and partly for dwelling. In seventy-seven thousand buildings, many of which are used in part for business or manufacturing, the whole population of New York, exclusive of a few janitors who sleep in the great stores and banks, is lodged, making an average of about sixteen persons to a house. As a considerable part of the present territory of New York City is occupied with small wooden houses, these figures indicate a crowding of population in the tenement-houses of the city proper which is sad to think of.

A MOVEMENT was recently carried out in Clifton, one of the beautiful suburbs of Cincinnati, which is quite characteristic of the people of that public-spirited region. Every one knows that Cincinnati suffers from the smoke of the bituminous coal forming the ordinary fuel of the city, which no smoke-statutes have yet been able to repress; but many of the occupants of the pretty villas on the hills surrounding the town refrain, more for the sake of their neighbors' comfort than their own, from the use of bituminous coal, and keep the air about them clear by burning only anthracite, or some other fuel which gives out little or no smoke. So far as we know, there has hitherto been no general understanding on the subject, each person following the impulse of his own sense of courtesy and cleanliness; but Clifton, which is one of the newer suburbs, has been increasing so rapidly in population of late as to inspire some fear among the earlier settlers lest the good custom which they themselves followed might be ignored by the new comers. One of the most energetic of them, therefore, prepared a paper for signatures, binding all who subscribed it to use in their houses only hard coal, coke or wood, and sent it about the village. It is certainly very much to the credit of all concerned that but two persons to whom it was presented hesitated to sign the paper, and even these two were understood to desire only a little time to consider the subject before joining in the agreement.

ON the Fourth of July the great Bartholdi statue was formally delivered to the United States Minister to France, in the Gauthier workshop in Paris. It is pleasant to find that many compliments were passed between the representatives of France and the United States, and the presentation and acceptance having been completed without any mishap, it is to be hoped that the statue will be quietly shipped to some place where its forlorn condition will not be observed, to await the time when another outburst of enthusiastic gratitude on the part of the American people shall furnish the money to pay for raising its pedestal a few feet higher. It is said that the day of the presentation of the statue was appointed also for the laying of the corner-stone of the pedestal upon the concrete base; but as the funds at the disposal of the committee were insufficient to pay, if not for a corner-stone, at least for any further considerable amount of masonry, it was found advisable to defer the ceremony. On many accounts, this decision seems to us to have been unfortunate. Among people so quickly responsive to generous sentiments as both the French and Americans, the simple expression of the regard which has subsisted for more than a century between the two nations would have been well worth the time which it might have taken; and no one, least of all a Frenchman, would have cared whether the erection of a costly monument, or the laying of a Philadelphia brick, furnished the occasion for reviewing the history of the time when France and the young American republic stood up together in defence of ideas which, under their lead, have in a hundred years remodelled the thoughts and habits of the whole world. We are very much disposed to think that if our own countrymen could be persuaded to think for a moment, with something of the sympathetic feeling of Frenchmen, upon the greatness of the work which French ideas have done for America, and American example has done for France, the response to the amiable feeling of the French toward the American people would be as general and sincere as was the movement in France which led to the presentation of the statue; and even if the eloquence of such an occasion should fail to stimulate subscriptions to the pedestal fund, the effort would have had its value, both in this country, as affording an opportunity for presenting international relations in the way in which they ought to be presented, and in France, as indicating a decent recognition of the sentiment which the gift endeavors to express, and which cares much more for some evidence that it is reciprocated than for the success or failure of any particular scheme for a pedestal.

THE company formed for distributing power in the city of Birmingham, in England, by means of compressed air, is nearly ready to commence operation, and all the plans have been made for setting up engines and compressors, which will furnish five thousand horse-power a day. The air is to be furnished under a pressure of sixty pounds to the square inch,

and the customers of the company are allowed to utilize it in such machines as they can contrive for the purpose, but those who desire to economize the power are warned that in order to do so to the best advantage it will be necessary to heat the air as they receive it to about three hundred degrees Fahrenheit. The cost of power to consumers will be forty dollars a year for each horse-power, where the air is used in large engines, and fifty dollars a year per horse-power where small engines are used. These prices approach very closely to the standard adopted by the New York Steam Company, and considering the difference in the circumstances at New York and Birmingham, as well as the expense which the consumers of the compressed air will be at in providing machinery of new and untried kinds and in heating the air delivered to them, we think that the advantage seems to be decidedly on the side of steam as a means of distributing power. Probably the people who intend to supply Birmingham with air understand what they are about, but if a town in this country, occupied, like Birmingham, by multitudes of small manufacturers, were desirous of introducing a public power-supply, we are disposed to think water might prove to be an excellent means of distribution. It is true that the water-motors now in use are, perhaps, less perfect as machines, than steam-engines, but they utilize the force supplied to them very successfully, and have the advantage of cheapness, and of being adapted to the use of a very small amount of power; so that with water under pressure at hand, at a low price, many persons would be glad to introduce small motors for driving grindstones or sewing-machines who would not think of setting up a steam-engine; and the company supplying the power might do a large retail business, so to speak, from which a steam company is cut off.

MOREOVER, the expense of obtaining and distributing water under pressure should be less than that of steam. Nothing is easier than to pump water into a pressure-tank or a stand-pipe, if the scale of the operation is so large that the draughts upon the pressure do not interfere with the regularity of the action of the pump, and in distributing the water there would be no loss or annoyance from condensation, no expense for non-conducting coverings to the pipes, no traps or expansion joints, and no inconvenience or expense from heat, either inside or outside the buildings where the power might be used; while the estimation of the power supplied to each customer would be a simple matter compared with the measurement of steam. It is true that the pressure of the water, starting with a constant tension in the pressure-tank, would vary with the height above the ground of the point at which it might be applied, but there would be no difficulty in lessening the pressure from the maximum for a given height to any required point, while the variation of the hydrostatic pressure would give the important advantage that the same water could be used, and paid for, several times over before it lost all its force, and passed into the return-pipes to be pumped back to the tank. There are many ways in which a skilful engineer might utilize this quality of a water-power supply, as distinguished from a steam supply. For example, the water delivered under pressure for driving sewing-machines in the upper story of a Broadway store would, after use there, be ready for operating the elevator, either in that or any neighboring building, and although it would be difficult to proportion the sewing-machines to the elevator in a single case in such a way that neither would ever lack power, and that there should never be any waste, an approximation to this result could be easily obtained by combining several buildings, under the control of the company's engineer, and in such simple cases as that of a machine-shop, using power quite uniformly throughout the building, a turbine wheel in each story would utilize the force of the water-supply in a way which would be quite impracticable with steam. Persons of an inventive turn of mind will think of many other advantages, and probably of disadvantages also, which such a system of water distribution would offer, but it is certain, that success in steam-supply has not yet been attained, and the hydrostatic system which is indeed, we believe about to be tried in London, may prove the best of all.

THE New York *Evening Post* has contained of late some timely editorials upon the waste now going on in the pine forests of the northwest, which has increased so rapidly within two or three years that the predictions of speedy exhaustion of the supply, which were almost laughed at two years ago, are now thought by many to have fallen short of the truth. One of the worst indications of the future of pine timber is noted by the *Northwestern Lumberman*, which says that the average proportion of lumber rated as first quality, which ten years ago was twelve per cent of the whole product, is now only two per cent, and this in the face of an enormous extension of lumbering operations, which now penetrate in every direction districts that were until within a few years thought to be far too remote from transportation to be profitably worked. As all the new districts are, of course, virgin forest, the only explanation of the decline in the proportion of good lumber must be in the fact that everything, large and small, good and bad, is now taken; saplings, which twenty years hence would bring twenty times their present value, being cut down with the rest, and sold for the lowest price. The most discouraging part of the matter seems to be that the lumbermen, instead of growing careful as the stock diminishes, get more and more reckless and destructive. The profits of the business are enormous, a single establishment sometimes paying its owners not far from a million dollars a year; and the temptation to kill the goose that lays the golden eggs by sawing up everything that can be sold seems to be too great to be resisted. As the *Evening Post* suggests, that the tariff, which imposes a duty of two dollars a thousand feet, equivalent, probably, to thirty-five or forty per cent, perhaps does something to increase the evil, both by encouraging the construction of mills, and through the feeling, which every mill owner must have, that as the impost may be repealed at any time, it is important to sell as much lumber as possible to secure the artificial profit while it lasts.

THE so-called "compound" system of steam-engine construction, which has been for some years in very successful use in large marine engines, is now rapidly finding its way, with certain modifications into the design of machines of small dimensions. Most people know that the compound system, as applied to marine engines, consists essentially in the addition of a high-pressure cylinder, generally a small one, to the one or two low-pressure cylinders of the ordinary condensing engine. The pistons of all the cylinders act upon the same shaft, but the steam is admitted first to the high-pressure cylinder, giving a preliminary impulse to the crank, and is then allowed to escape into the low-pressure cylinders, usually placed on each side, where it operates a second time upon the same crank, under diminished tension, but through the medium of a greatly increased piston surface; and having accomplished here all the work of which it is still capable, it passes off into the condensing chamber, to be converted into water and used over again. The reason why this double impulse should be more effective in its results than a single one does not seem very clear, but it is found in practice that something like one-third more work can be obtained with a given expenditure of fuel in a compound engine than in one of the old kind. It was, perhaps, not unnatural that the advantage of adding an energetic high-pressure cylinder to the ordinary pair of low-pressure ones in a marine engine should have been more obvious than that of adding low-pressure cylinders to engines which are always operated at a high pressure, and which waste all their exhaust steam; but, the experiment once tried, it was found that nearly the same economy could be obtained in the latter class of machines as in the former, and small stationary engines, steam-pumps and even locomotives are now everywhere being built or altered to conform to the new system. As applied to steam-pumps, which are among the simplest of machines, the "compounding" takes the form of the addition of a large low-pressure cylinder directly in front of the ordinary high-pressure one, the piston-rod extending through both. Steam is admitted under the boiler-pressure to the small cylinder, starting the piston, and at the cut-off, instead of expanding in this cylinder only, is admitted behind the large piston in the other cylinder, where it appears to complete the stroke much more advantageously than when retained in a single small cylinder. The extension of the principle to locomotives seems to be its latest application, and considering the high pressure at which these are always operated, and the small account which is taken of waste of fuel in them, in comparison with the more important qualities of quickness and certainty of control, it may be questioned whether it is altogether suited to the needs of such machines, but it appears from the foreign journals that in England and France, at least, the compound locomotives now built in the former country are coming rapidly into favor, giving an advantage in economy in fuel which does not seem to be counterbalanced by inferiority in other respects.

AN AMERICAN PARK.

IF you would like to see the original and only garden wherein Mother Eve and Father Adam built their home, and commenced housekeeping, come with me for an afternoon on a trip into the country adjacent to New York, and about an hour from the city. Now, it is generally believed that there are no suburbs to New York that may be truthfully called healthy or beautiful, but only either marshy lands, low and muddy, covered by a constant fog of malaria, or besieged by clouds of insects, known as mosquitoes, but which have been given the reputation of being regular full-fledged birds in New Jersey. Our trip to-day will banish all such ideas. Undeniable traces exist which prove its Edenic origin, and although there have been no fossil remains of his snakeship, or the disputed spare rib yet unearthed, most unmistakable apple trees have been found, besides an abundance of "trees that are pleasant to the sight." Whether it is, however, as Mohammed surmised, one of the seven heavens, has not yet been proved, although there are some people who believe it to be fully as pleasant.

I remember being impressed some few years ago by an article which appeared in one of our monthlies, entitled "Bedford Park," a suburb of London; and upon a visit to that beautiful spot being very much struck with the quaintness and picturesqueness of its homes and its little church, but, on the other hand, being much disappointed with the generally shabby and cheap methods of building, and the rather monotonous flatness of the country: it was not an Eden, although it was beautiful. We shall find this afternoon a more beautiful location, better built homes, and shall leave you to your own impressions of their picturesqueness.

The spot is many hundred feet above the sea level, and from almost any point can be seen at night the harbor lights, with the wooded heights of Staten Island and Navesink beyond. As we talk, we are rapidly leaving the city behind us, and each minute brings infinite relief from the dust and din which daily surrounds the man of business, and which emphasizes the expression,

"God made the country, man the town."

Our train being an express does its business quickly, and we are soon whizzing past an old wind-mill, which lazily revolves, and brings to memory the valiant Don Quixote. Not unlike the thousands of wind-mills in Holland, too, is this one, since its mission is fulfilled in constantly pumping, pumping, pumping and storing water for the little park beyond. Just behind it, and surrounded by extensive grounds, is a large brick mansion, the home of the gentleman to whose indefatigable interest the park owes all its improvements.

As we swing around the curve, a bevy of ladies and gentlemen spring into view, dressed in lawn-tennis suits, and whacking away at a poor little ball with a vigor which seems to threaten destruction to the poor little fellow as it bobs hither and thither, and ends at last by making a "love" for some one, leaving the points for the others.

"But come along, don't stand gaping at this 'view of fair women,' for we have not come out here to witness this every-day occurrence, but, rather, to get a breath of clear, bracing, unadulterated air, and to get a view of the pretty homes all around us."

As we turn from the station a quaint-looking building with a quainter tower appears from behind the trees, and we find that it is a building dedicated to the Muses. Just take a peep inside: the walls and ceiling are in wood-work, the sides arcaded, and the ceiling in open truss-work. In one of the arcades is a huge fireplace, which we are sorry to be told engages ever and anon in the luxury of smoking, but which certainly never ought to do so. The proscenium arch is wide, and with panelled sides, while across the arch runs an open-work of turned spindles; and on the stage is an abundance of scenery, dressing-rooms, and the luxury of gas throughout the whole building.

Here the Doctor of Alcantara once mixed his vile nostrums; here pretty Miss Patience and love-sick maidens languished with soulful utterances, and here monthly are performed gems of dramas and song by native talent, who afterward make things merry with Terpsichorean sports.

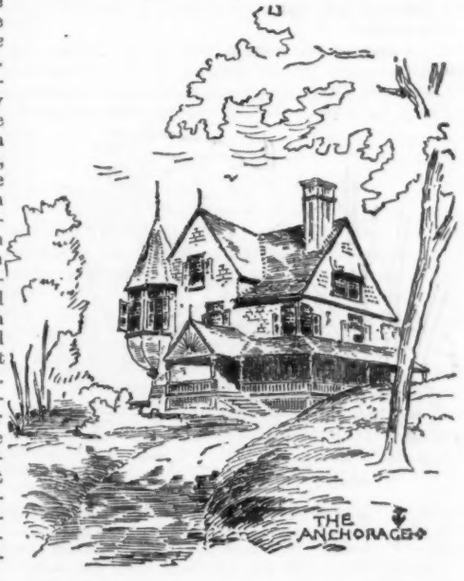
Near the Music-Hall, and overshadowed by large trees, is "Greystone Cottage," with its inviting porch and circular stone bay. Were you to step inside you would, no doubt, be made doubly welcome, first by its owner, then by his trusty dog, and peeping around your mind would be carried far away to foreign climes by *bric-à-brac* of Oriental shape and fashion. A large group next meets the eye as we pass under the large trees and across the lawn. The landscape is made up of old birch, oak and chestnut trees, from the foliage of which spring turrets, chimneys, gables and oriels. There is a large picturesque Queen Anne house, with its stained shingles, here two more smaller ones, and under the trees a Swiss cottage, with roof projecting four feet or more, and with a veritable bird's-nest hanging from one corner. On the staircase hangs the hospitable name "Engleside." A wide piazza greets you, and the shingles are black and rusty with apparent age; not so, however, for there is not a house here that existed six years ago.

Across the way, and backed up by a veritable forest of tall chest nuts, stands "Redstone," with its high roof and massive chimneys

which seem to indicate a roaring fire at the base of each one, and so there is at times. If you do not believe in open fireplaces, and large ones, too, just step in here and sit down for a minute before the hall fireplace, which measures five feet in the opening. The hall itself runs two stories high, with an open-beam ceiling; the walls are colored in Indian red, and on one side of the second-story runs a regular Romeo and Juliet balcony, which looks directly over into the great fireplace below. You may, if you are fortunate, see three or four little heads peering through the balustrade, but do not be alarmed, you came to see the fireplace only.

Whole logs disappear within this cavern in winter, and give out not only heat, but a sense of hospitable cheer and comfort, which puts to shame the most expensive iron, brass or gold grate-fireplace ever placed in the city of New York. "Hearth, Hall, welcome all," cut in the frieze means just what it says. The staircase is very wide, with a knight in full armour in glass-work in the large window, and on its landing stands an old clock that strikes a cathedral gong; it tells us also that we must hurry on, but not before getting a glimpse of the dining-room conservatory, in which a fountain plays away to its heart's content, and showers itself upon gold-fish and turtles; a lemon tree stands beside it in full fruit, and with beautiful effect.

From a balcony we look across and see the picturesque roof of the "Seven Gables." The abundance of the trees which surround the houses shows here and there a gable, but you must seek many positions before you see the *toute ensemble* of this house. Above the library bay breaks a square balcony with curious posts, and from the dining-room runs a wide piazza, with large pavilion hung with hammocks and swings, which offer a cool and inviting retreat from the sun. Could Hawthorn enter upon this scene he would probably seek out the quaint library, with its simple brick fireplace, and well-filled shelves.



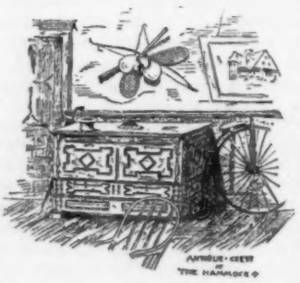
One would conclude that a house with the restful name "An chorage" might be the home of one who had known the sea. So it is, rightly guessed, and if you can find a trimmer craft in the whole

squadron we should like to see it. It looks down upon you from an eminence, and from its crow's-nest hanging from a corner you may see far away to sea, while high above from the mizzen-top, as it were, flies a metallic pennant. Further, I give you my word, if you enter the cabin door you will receive a hearty welcome, and the best the ship affords.

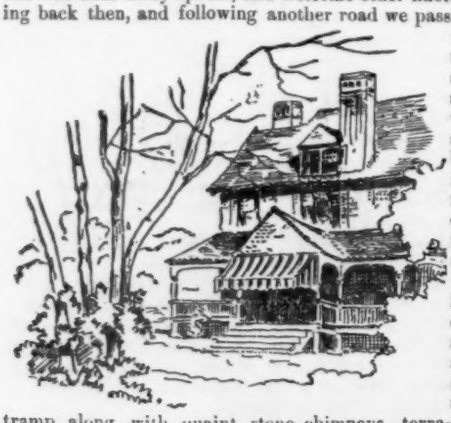
In your view from its windows, you have, no doubt, looked across to "Sunnyside," with its outside chimney; across the brook to "Oak

Lodge," or the other way through the forest trees to "Montview," with its superb little park in front, fitted up with swings and hammocks and everything to make glad the hearts of the children. Winding around the road you come upon a new stone house partly built, and promising to be a beautiful production; a low, massive, arched entrance, with cobble-stone ornamentation; a stone terrace; a long simple roof broken by dormers and ornamental chimneys is all that forms this beauty, but its dignified appearance is most pleasing. If you look across from this terrace three or four more houses appear, each bearing its particular charm, and surrounded by the forest trees.

Only a short distance off is the "Hammock," with its slanting roof and circular stone bay, and through the tree-tops are the gables of another, from whose windows come strains of most enchanting music. In the former an old chest will catch your eye as you enter, which is — well, I dare not say how old, but something less than a thousand years, I fancy, and over which are hung rackets, bows, arrows, boxing-gloves and other implements of prowess. Still farther on we pass the "Chestnuts," with its quaint staircase, and then on to the "Last Resort." "Excuse these tears in business hours," says my companion, "but I actually weep with bygone laughter to think of the stories that have emanated from that roof, and actually loosened its very shingles, besides adding avoirdupois to many a resident who believes in the 'laugh-and-grow-fat' theory." Almost hidden among the trees you will find it a cool place in summer, and a warm, jovial one in winter.



If we keep on this present road we shall enter the primeval forests, untouched as yet, but awaiting the time when the woodsman's axe will clear away spaces, and welcome other habitations. Turning back then, and following another road we pass the "Châlet," with its stone terrace; opposite, another stone house with crow-stepped gables, and, built into the hill, reminding us of many a Brittany house, still another with a quaint little porch, oval windows and ample piazzas. Others spring out from the foliage as we tramp along, with quaint stone chimneys, terra-cotta crest-work, and one with little windows piercing the chimney. But in the centre of all these is a veritable little mountain church, with stone bell-turret, from which ere long will issue the sound of a chime of bells. This is a fact, we are confidentially informed by a resident, who is evidently not the sexton, nor does he pump the organ, but is just as much interested in the church as if he did. The interior is about seventy feet long, and covered by an open-trussed roof, ornamented with simple Gothic tracery. Step under the low massive arch into the chancel, and look back; the afternoon sun streams through a large and magnificent memorial window, and floods the nave with subdued light, bringing out the tints of the wall, and the warm wood-work of the benches and little wine-glass pulpit.



My companion, wretch that he is, remarks that he "has n't stayed in a church so long for a year," and is anxious to get out, so we will continue our tramp down the hill. "Hickory Hill" shields the home of piazzas, and the "Lodge" below, which, although the smallest house in the park, *is* so minute and pretty that many an eye has looked upon it with envy. We are coming now to a view of which I wish you to take particular notice. On a knoll stands a large brick house, "Knollwood" by name, with spacious piazzas and balconies, and in front of this we will sit down under the large branching trees. Before us, and far to the south, are the Narrows, the heights of Staten Island and Navesink; nearer, is Newark Bay, and scattering here and there in the middle distance are villages looking like so many little paper boxes. Among them is old Springfield, of revolutionary fame. There it was when the British invaded the town that old General Stark shouted to his brave little band, "At 'em boys, they 're ours to-day or Mollie Stark's a widow!" There, too, is the little white church steeple, made memorable by the good old deacon, peaceable enough in peace, but no less determined in war, who, finding that the boys were getting short of gun wadding, rushed into the church, and bringing out an armful of hymn-books yelled out, "Give 'em Watts, boys, give 'em Watts!" and sure enough they did give them Watts to the music of whistling bullets, and many a house bears the marks of returning shots. Glorious times those for old Springfield! She gained renown for her patriotic spirit, and the little graveyard, old and mossy, testifies to her loyalty.

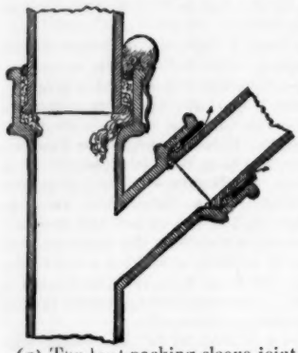
The old wind-mill, too, is seen lazily revolving, and in the immediate foreground are half-a-dozen more houses. Directly at the foot of the hill, and flanked by a row of large chestnut trees is a house which frightened the neighbors by its sunset effects. It is named "Sunset Cottage;" if we mistake not the name is wrought in sea-pebbles on a rough-cast panel. A quaint Brittany turret occupies one corner, with a sun-dial on its face bearing the motto, "*Ars longa est, vita brevis est,*" and on

the other side is a massive chimney tapering towards the top, and with a veritable water-butt at its base. The coloring is a dull golden stain at the gable tops, gradually shading down into deep Indian red at the base, and were there an old well-sweep there we would swear the house to be a hundred years old.

But there sounds the whistle! a quick train will take us back to the city, so let us away. We have had a good tramp, a pleasant afternoon, a glimpse of thirty or forty houses, and a good long sniff of pure mountain air; what more could one desire?

SANITARY PLUMBING.[1]—XXV.

CLASSIFICATION OF THE DIFFERENT KINDS OF JOINTS.



PIPE joints may be divided into four general classes:—

I. The bell-and-spigot joint.
II. The sleeve joint.
III. The screw joint.
IV. The flange joint.

These may be subdivided as follows:—

I. The bell-and-spigot joint into:—
- (*a*) The hand-calked lead.
- (*b*) The machine-calked lead.
- (*c*) The ball-and-socket.
- (*d*) The rubber ring.
- (*e*) The soft packing.

II. The sleeve joint into:—
- (*a*) The lead-packing sleeve joint.
- (*b*) The plain-ring " "
- (*c*) The divided-ring " "
- (*d*) The bolted-ring " "

III. The screw joint into:—
- (*a*) The flanged screw joint.
- (*b*) The inner-ring " "
- (*c*) The outer-ring " "
- (*d*) The plain " "

IV. The flange joint into:—
- (*a*) The spigot-and-socket flange joint.
- (*b*) The spherical " "
- (*c*) The loose-ring " "
- (*d*) The wedge-and-key " "
- (*e*) The plain non-adjustable " "
- (*f*) The plain adjustable " "

I. The Bell-and-Spigot Joint.

(*a*) Figure 135 shows the ordinary hand-calked joint. It is made with lead and oakum or jute. A gasket of jute or other similar fibre is inserted into the cavity of the bell or hub, and the spigot end of the length next above it is set firmly down upon it, or the gasket is rammed in with a tool after the lengths are set up. The gasket is used to prevent the lead from running out of the joint and obstructing the bore of the pipe at some point below, besides wasting the lead. The lead is now poured upon the gasket from a ladle, and shrinks as it cools. The calking-tool must then be used to expand it again, and drive it into the cavities and pores of the iron. A faithful and skilful operator can, by perseverance, succeed in fitting the lead into the iron at all parts of its circumference, so as to make it tight for a time, just as a painstaking dentist can drive the gold, by patient labor, into the cavities of a tooth, and temporarily arrest its decay. But the process in both cases is slow and uncertain. The dentist confines his calking to a single small spot, well within his reach, and he labors with extraordinary care. Yet the filling often fails when put to the test. The plumber must work quickly over an extended field often in awkward positions; he must perform a delicate task with clumsy tools. The metals to be welded together are often so placed that it is impossible, without the utmost patience and skill, to reach them properly. The result is that when put to the test the joint *almost always* fails. Extra-heavy pipe and hubs are required to withstand the blows of the calking-tool. Lighter pipes cannot be made tight without danger of cracking the iron. The writer has made a number of tests on pipes of different thicknesses with the aid of an experienced pipe-layer and calker. With double-thick pipe joints could be made which would stand the hydraulic test or a water-pressure equal to that produced by such a test at the bottom of an average city house. Almost invariably a second calking was found necessary after the plumber had carefully done the work once in a manner which he considered sufficient, and had pronounced it completed. The single-thick pipe could not be made to stand the water-pressure test at all. It was cracked by the calking-iron before it had been made tight. Were the hydraulic test, now recommended by sanitarians, to be applied to all the cast-iron soil-pipes set up within the last year in city houses, not one in a hundred would be found to hold water. The experiments of Colonel Waring and other authorities in this direction fully corroborates this statement. Colonel Waring says, "I have recently had occasion to test the soil-pipes of a large house of the best class, where the greatest effort was made to secure tight work, where the joints were so exposed that there was no difficulty in calking them thoroughly, and where there was every reason to suppose that every joint was absolutely tight. On closing the outlets, and filling the pipes with water the whole system leaked like a sieve."

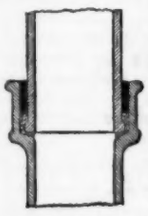


Fig. 135.

The ordinary Hand-Calked Bell-and-Spigot Joint.

It is now generally recognized and acknowledged that a plumber's calked joint is rarely either air or water tight, though a vast amount of lead and labor is spent on them to make them so. When we reflect that the sole aim and object of a soil-pipe joint is to make a gas and water tight connection between pipes, we see that the method commonly employed is an absurdity, and reflects little credit upon human ingenuity.

Even supposing that, by chance, a calked joint has been made to stand the test which is now properly required of it when new, its tightness is very soon destroyed by the expansion and contraction of the pipes, caused by the passage through them of hot water or steam. The expansion of the spigot is in such cases greater than that of the hub, because it is on the inside nearer the heat and not protected like the latter from the hot fluids passing through the pipes. Hence, the lead is temporarily compressed between the spigot and hub, and, being inelastic, does not resume its original bulk when the pipes cool again. A minute opening is thus formed all round the spigot, as shown in the lower branch of the pipe in the initial cut, and the joint leaks.

The object of requiring the whole system of pipes used in plumbing a house to be filled with water as a test, is not only to determine the tightness of the joints in a manner which is impossible with the peppermint or smoke tests, since these can be eluded by a temporary coat of paint or putty; but also to try the quality and thickness of the metal. If a pipe is very defective in casting its weakness will be revealed by a strong pressure test, and the faulty piece rejected.

The longitudinal expansion and contraction of the soil-pipe also affects, often still more seriously, the calked joint. When a length of pipe contracts the spigot is drawn away from the hub of the adjoining pipe, and if the second pipe is held fast the hub cannot follow it. The two must, therefore, separate slightly, and the movement draws the lead ring outwards with it. The spigot then returns again under the influence of expansion, but the lead ring does not necessarily return with it, but often remains protruding slightly from the socket, and the joint leaks. This process may be repeated until the lead has been drawn out a considerable distance from its proper position. Every plumber knows how common a thing it is to find the lead thus protruding from the socket in pipes which have been for a certain time in use in trying positions.

The calked joint is incapable of resisting any severe tensile strain which is often brought to bear upon it by the settling of the house. The only thing which resists such a strain is the artificial contact or compression produced between the two metals. This may be very feeble with smooth pipes, where but a small quantity of lead is used, and the calking has been spared.

Another serious objection to this joint is the difficulty of disjointing pipes in which it is used. The usual way to take out a pipe, once so put together, is to break it to pieces, and then remove it by degrees. There is, in fact, no practicable alternative; for to melt off the lead would not only be expensive and dangerous, but involve the disjointing of quite a considerable length of pipe in order to enable a single spigot to be lifted two inches, or enough to disengage it from its hub. Now alterations in our plumbing arrangements are necessarily so frequent that this objection becomes a serious one.

The necessity of using fire in a house in process of construction for melting the lead necessary to make this joint is also a formidable objection to it, on account of the danger of igniting the surrounding carpenter's litter, and burning down the house. It is true that lead or solder melting would have to be carried on for other purposes, such as wiping the joints on the smaller pipes, but the less use we have for the solder-pot the less will be the danger, and the less the temptation for the workmen to carry on the melting in dangerous places in order to save himself the trouble of running up and down wearisome flights of stairs to a place of safety.

Still another very serious objection is the temptation this joint opens for fraud. The lead may be partially or even wholly omitted without very great risk of detection, since it is out of sight, and frequently immediately covered by a coat of paint. The calking may be still more easily slighted. If the hydraulic test is not demanded, a coat of paint or a little putty will easily make the joint stand the smoke or peppermint test. A few of the joints well within the reach of the house owner may be filled with genuine lead, while all those which are covered by floor boards, or are not easily accessible may be composed of paper and sand, and covered with putty. Possibly a thin coating of lead may be poured on top to present an honest appearance, and satisfy the suspicious and shrewd house-owner who goes about probing the nearest joints with his pen-knife in order to ensnare "the rascally plumber."

The "*Sanitary Engineer*" narrates a striking illustration of audacious fraud in the use of paper and sand joints, as follows:—

"I cannot better describe it than to quote a conversation I recently had with a journeyman plumber who had been looking for employment. He said: 'I was looking for work, and I went into a shop on Second or Third Street, I am not sure which, and asked for a job. I was told that they needed no more help, and the clerk proceeded to inform me that they had a man that was able to iron-pipe two ordinary three-story-and-basement houses in a day. I pretended to doubt this statement, when he said, 'Why —— bet the boss five dollars he could do it, and he did it and won the five dollars.' I asked the man, who was standing by, how it was possible to even stick the lengths together, or even calk them at all. He replied, 'Oh, I just put a little paper in each joint, poured in some sand, and then, when the pipe was all up, I went over the job with my pot and ladle, and poured a little lead on the front of each hub.' This

[1] Continued from page 375, No. 444.

frank admission fairly indicates the character of a great deal of work that has been done this summer in many parts of the city."

The initial-cut shows a defective joint produced by carelessness, which is only another form of fraud. The jute has been driven beyond the end of the spigot, and projects into the interior of the pipe, forming an obstruction to the water-way, and the nucleus of a deposit which may ultimately choke up the drain.

By careless packing of the jute, also, lead may be dropped through the crevices in the packing, and itself form an obstruction in the pipe. A large amount of lead is thus lost to the master-plumber by his workman.

Where putty is used over the jute packing instead of lead, rats and mice may eat away the putty, or it may be cracked by jars or settlements in the building, and an entrance for sewer-gas be thus occasioned.

Mr. William Paul Gerhard, C. E., in his excellent book, "*Hints on the Drainage and Sewerage of Dwellings*,"[1] well says, "no other part of a common plumbing job shows so many defects as a stack of iron, soil or waste pipe; there is scarcely another detail in a system of drain-pipes for a dwelling in which so much rascality or criminal stupidity is shown than in the manner of making joints in iron pipe, and this is especially the case wherever architects or builders tolerate such pipes to be built into walls, inasmuch as, under such circumstances, defective joints are readily covered up and brought out of sight. . . . The manner of applying the gaskets of oakum; the quality of the melted lead; its purity; the temperature to which it is kept in the pot on the fire; the manner of pouring the lead, and, finally, the operation of calking it after shrinking; these are all details worthy of careful consideration, but, unluckily, seldom looked after in plumbing a dwelling. . . . It has been my personal observation that honest and conscientious plumbers—with best possible intentions to do only first-class work — were frequently unable to calk the lead of joints sufficiently tight without splitting the hub of the pipe. In other cases the joint could not be made tight owing to the impossibility of reaching all parts of the lead in a joint with the usual calking tools, the soil-pipe being located in a recess or partition."

There is still another very serious fault in this joint. It is a fault but little considered heretofore, because it is only of late that it has been found necessary to apply the hydraulic test to pipes of the soundness of which we desire to be assured. Pipes so jointed admit of no simple method of closing temporarily the ends and branch-outlets left for connection with fixtures in order to permit the pressure test to be applied.

It has been the writer's custom invariably to specify that the hydraulic test should be applied whenever he has called for ordinary pipes; but he has never been able to have this provision executed without the utmost difficulty. The plumber uses every possible means to avoid the task. He knows in the first place that it will inevitably betray a host of leaky joints and defective pipes unless his work has been done with extraordinary care, and attended with unusually good luck, and few plumbers have, as yet, provided themselves with the proper appliances to close the openings in a satisfactory manner. Thus, though the pressure test is of the utmost importance, architects find it exceedingly difficult to enforce its application. Where it is called for in the specification it is beginning to be customary for plumbers to raise considerably their figures when they believe this provision will be enforced. Although there are several ways of accomplishing the temporary closure of the outlets, all of them are expensive, and difficult of application. The most common way is to press India-rubber plugs against the outlets by means of iron disks, rings, bolts and nuts of various forms.

Speaking of the great importance of applying the pressure test, the "*Metal-Worker*" says: "A pipe may be tight and apparently sound, yet of so thin a substance that the least pressure will destroy it or break it through. Joints may be tight at the moment, though barely filled with a thin coating of putty blown out almost at a single breath. Such pipes, though tight for the moment, are not safe against the slightest pressure, and at any time may be liable to have their continuity broken by a slight jar. The longer we study this subject, the more completely do we become convinced that the true remedy for this state of things is a test of the soil-pipes by pressure. Scamping is so easily done, and so difficult of detection that it seems impossible to avoid it, even in the best jobs which may be constructed. A large proportion of the work is done in difficult situations, where the workmen has every temptation to save himself labor and discomfort, and in such situations poor work is the rule rather than the exception. . . . . The real objection to such a test is to be found in the fact that it calls for perfect workmanship throughout. It demands just what every house-builder and house-owner wishes to have, but just what it is very difficult to obtain from even the best plumbing establishments in the city. In gas-fitting, which is much less difficult than plumbing-work, no sane man would dare to trust a large job without carefully testing it under pressure. We do not think it will be many years before the method of testing by pressure will be made a requirement in the best jobs of plumbing-work."

Finally the lead-calked joint when faithfully made, is very expensive both in material and labor. The amount of lead required for each joint, including waste, is estimated at about a pound for every inch in the diameter of the pipe. Thus an ordinary 4-inch soil-pipe consumes four pounds of lead in each joint.

[1] Published by William T. Comstock, 6 Astor Place, New York: 1884.

The average length of time required by a skilful pipe-layer to make a single joint is estimated at twenty minutes, not including, of course, the planning of the pipe-system or the cutting and general arrangement of the pipe sections for their proper positions, a part of the work which has no connection with the kind of joint used.

Instead of filling the joint with lead, it has been suggested to use some alloy which expands in cooling. But this is open to the important objection that most of the alloys which possess this property are too expensive. Old type-metal is perhaps one of the cheapest alloys which has been suggested for this purpose, but the antimony it contains renders it too hard and brittle. Belvidere bronze or Spence's metal, an alloy of iron and sulphur, has been tried in England. It is also brittle, and has the additional disadvantage of requiring the pipes to be heated to ensure its running all round the hub, owing to its very low melting point. Nevertheless the writer has seen excellent joints made with this material which has the advantage of being economical, and when properly applied, of making a tight joint without calking. Our experience with it is, however, too limited at the present time to enable us to make any positive statements regarding its use for pipe-jointing as a substitute for lead.

Thus we find that the ordinary hand-calked bell-and-spigot joint possesses only one of all the eleven desiderata given in our table of requirements for an ideal joint. It is unreliable, incapable of resisting the effects of expansion and contraction, or heavy strains; requires unusual skill in its formation; will not admit of disjointing for repairs without its partial destruction; affords every opportunity for fraud by covering up the traces which might lead to its detection, and it is expensive. Its only important merit is its compactness and the facility with which it may be made to conform to the irregularities of the structure for which it is intended.

If now we examine the form of this joint from a scientific standpoint with a view to determining the principles which give rise to its failure, we shall arrive at the following conclusion: Its inability to resist changes of temperature is due to the fact that the bell and spigot are so placed relatively to each other and to the interior of the pipe that they cannot be equally affected by changes of temperature, from within or from without; while the packing is so placed that when the pipe is heated, say from within, it is obliged at every point of its circumference to receive the full compression due to the excess of expansion of the entire diameter of the spigot over that of the bell. In other words, the *smallest* dimensions of the packing-ring is obliged to receive nearly the entire variation of size of the *largest* dimension of the spigot. The thickness of the ring is reduced by the expansion of nearly the entire diameter of the spigot, and owing to the absence of the property of elasticity in lead, the reduction in the thickness of the packing-ring is permanent while the alteration in the size of the spigot is only temporary. From this consideration we deduce the following laws with regard to the form of pipe joints:—

(1) *No bell-and-spigot joint having packing between the bell-and-spigot is capable of withstanding the effects of the lateral expansion and contraction of the pipes unless the packing has an elasticity sufficient to restore the alterations in its thickness produced by the difference of expansion and contraction of the entire diameter of the spigot over that of the bell.*

(2) *Inasmuch as no packing material having this degree of permanent elasticity has been as yet discovered suitable for drain-pipes, no bell-and-spigot joint having packing between the bell and spigot is capable permanently of withstanding the effects of considerable variations of temperature such as are produced in plumbing by the passage through them of hot water or steam.*

Another point which is defective, regarded from a scientific standpoint is the direction in which the power required for calking is applied. The surfaces to be welded together are at right angles with the pressure applied instead of being in a direct line with it, as it should be. Hence a great loss of energy is sustained, and in order to render it possible to apply power in sufficient quantity to do the work it must be applied successively at small portions of the joint at a time, instead of simultaneously over the whole. From this results a loss of time, and the peculiar form of the hub renders it necessary that the calking be done through the medium of a tool by hand, which increases the loss both of time and energy. The edge of the tool cannot be made to fit exactly the space between the bell and spigot, but must be considerably smaller in order to allow for variation of casting and setting. Hence, it acts like a blunt chisel, partially embedding itself in the lead at each blow of the hammer instead of exerting a uniform pressure exactly at the points desired. The proper use of the tool under these circumstances requires considerable skill on the part of the workman, and, as the effectiveness of the calking depends much upon the manner in which the tools are handled, the quality of the joint is largely dependent upon the skill of the operator, whereas it should evidently be entirely independent of skill, the required degree of skill being not always at hand. A still further loss of energy is accordingly sustained, inasmuch as it is contrary to the theory of chances that, even presupposing the most perfect skill of manipulation, the precise position and direction best suited to the varying conditions of the metals to be welded, should be given to the calking-iron at every blow. From these considerations we deduce a third law regarding the form of pipe joints, namely:—

(3) *The joint should be so constructed that the power required for its formation may be applied to the best advantage, and its application must be independent of skill on the part of the workman.*

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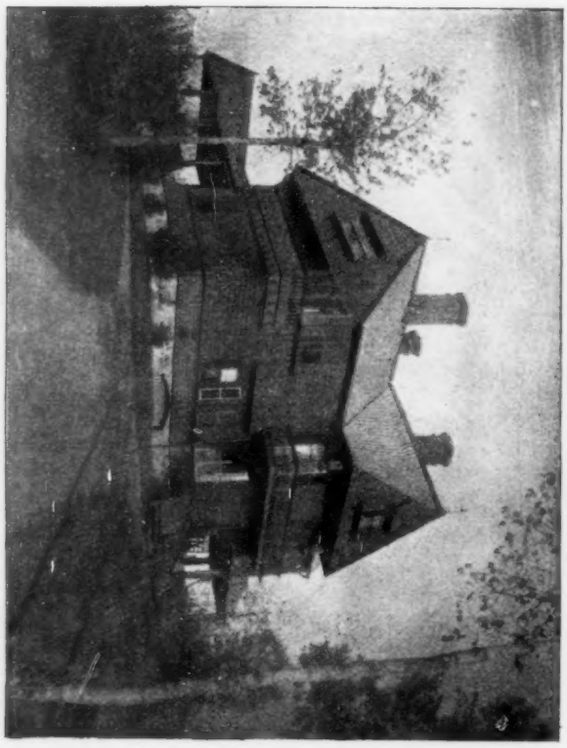

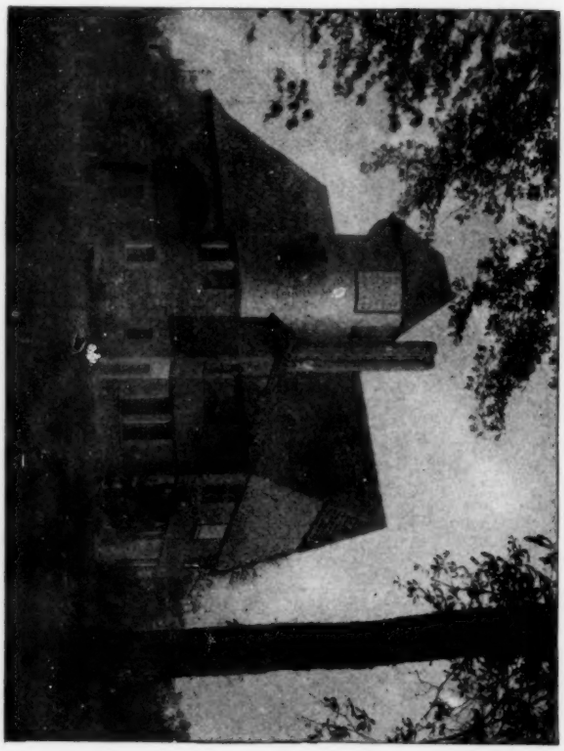

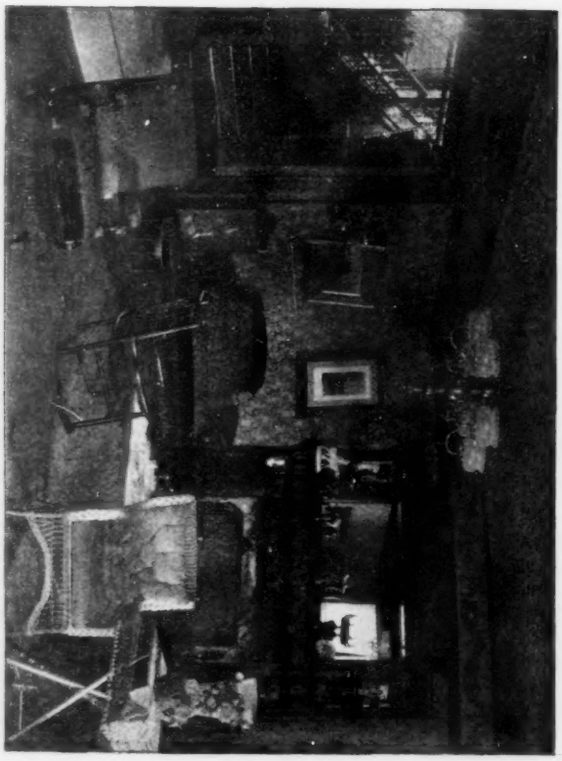

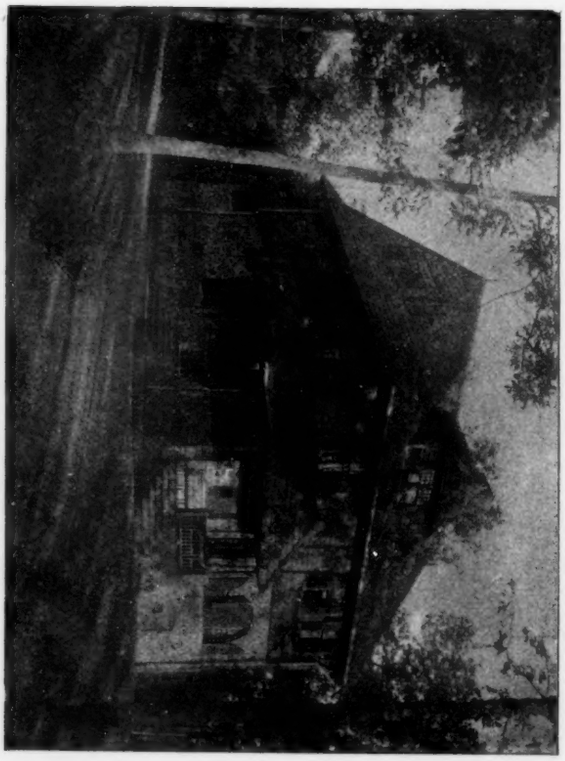

VIEWS AT SHORT HILLS, N. J.

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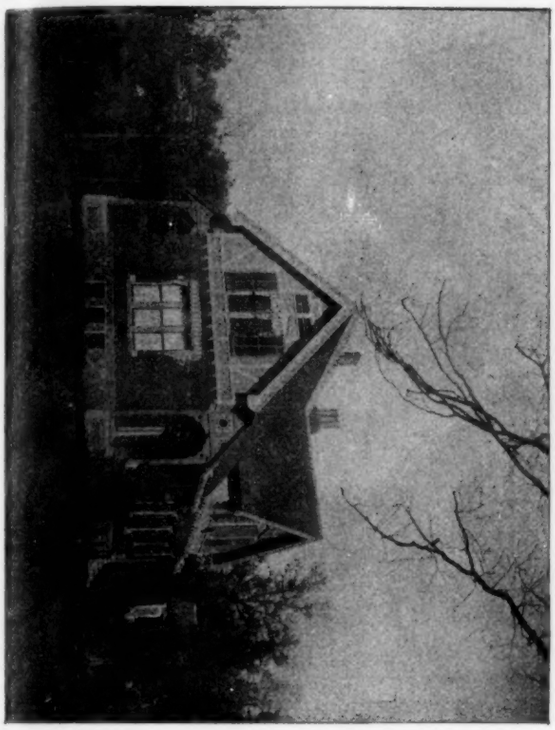

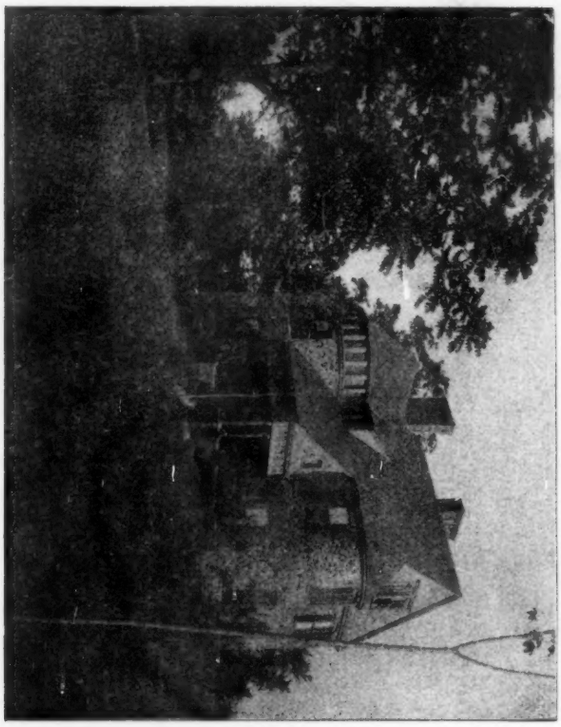

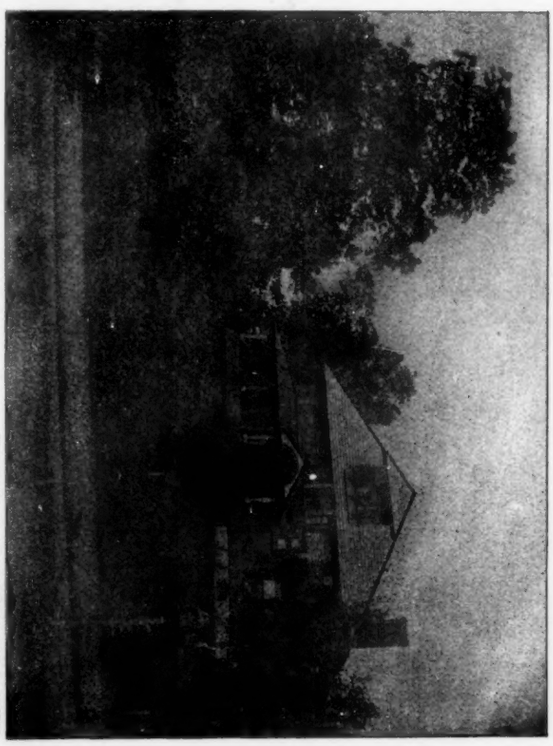

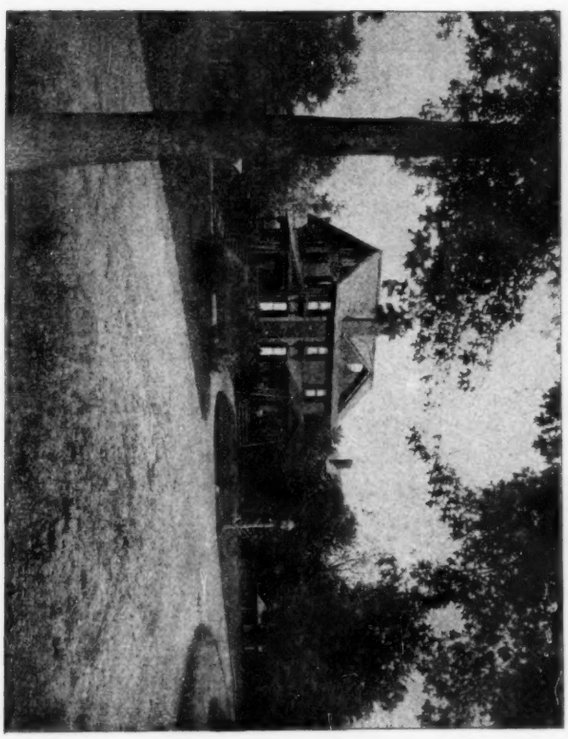

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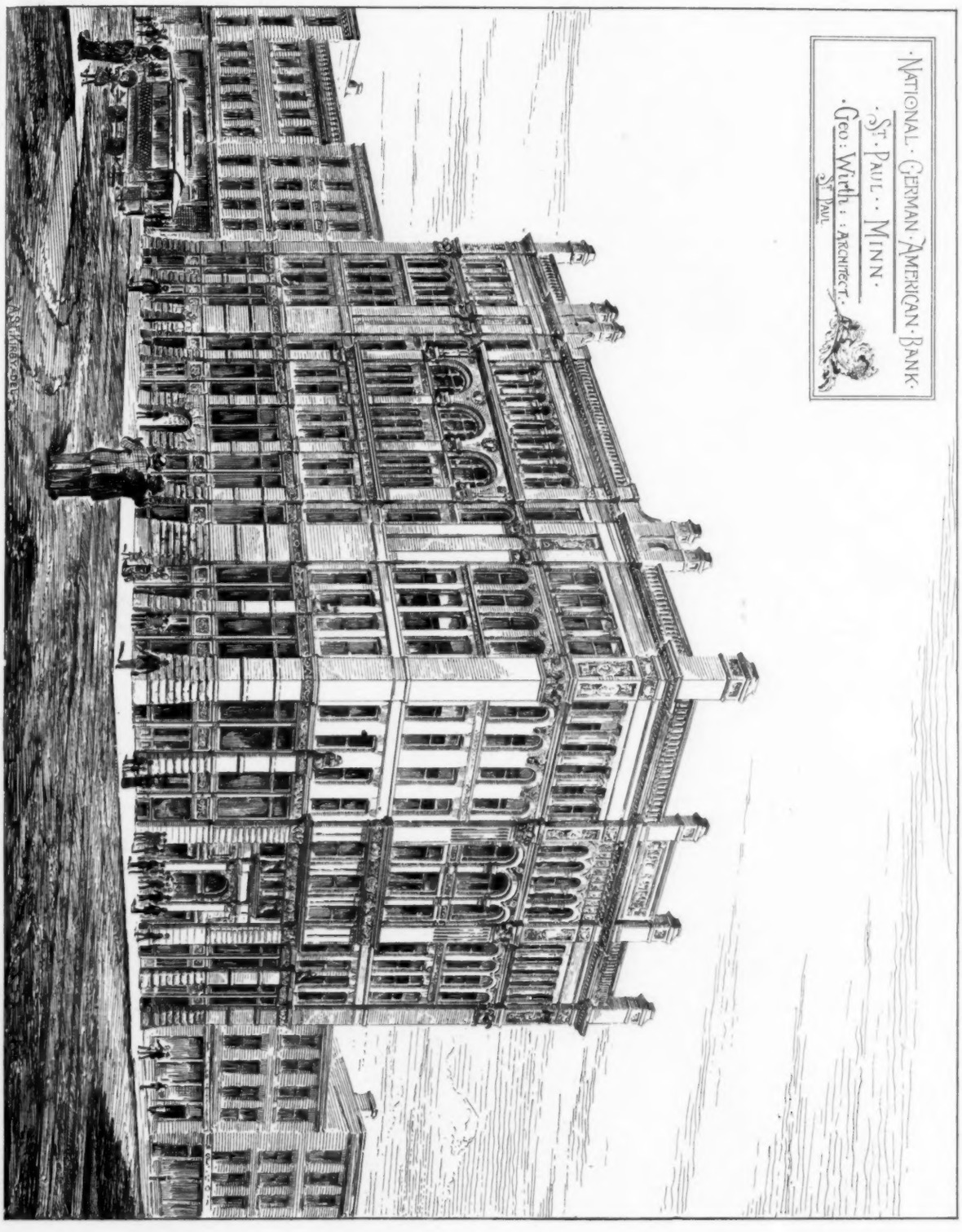

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THE ILLUSTRATIONS.

VIEWS AT SHORT HILLS, N. J.

AS we think it not impossible that the negatives (amateur) from which these views are reproduced may have got mixed, we will not attempt to identify them, but will leave readers of "An American Park" to puzzle out the names and titles from the description therein. We can only say that the "Music Hall" is the work of Messrs. McKim, Mead & White; the "Anchorage," "Engleside," and "Seven Gables," of Messrs. Lamb & Wheeler; "Sunset Cottage," and "Redstone," of Messrs. Lamb & Rich; "Knollwood" (not shown), and the "Lodge" of Mr. A. B. Jennings, all of New York; while "Greystone" (not shown), was designed by Mr. W. H. Wood, of Newark, N. J.

COTTAGE FOR MISS L. E. WISNER, WARWICK, N. Y. MESSRS. BARTBERGER & DIETRICH, ARCHITECTS, PITTSBURGH, PA.

THE NATIONAL GERMAN-AMERICAN BANK. MR. GEORGE WIRTH, ARCHITECT, ST. PAUL, MINN.

THE size of this building is 100′ x 150′; size of banking-room 50′ x 100′, 18′ high. The building is arranged for offices, has two elevators and forty-five fire-proof vaults. Stairways of iron and slate, with partitions and floors made with hollow fire-proof materials; all girders are iron. The fronts are faced with Philadelphia pressed-brick and terra-cotta from the North-Western Terra-Cotta Company, Chicago. The piers in the basement are of Duluth brown-stone, with pilasters of polished jasper. The banking-room will be finished in birch and bird's-eye-maple. The cost of this building will be $225,000.

STAIRCASES.[1] — IV.

THE TRANSITIONAL PERIOD IN ENGLAND. — ELIZABETHAN.

"The stately homes of England,
How beautiful they stand!
Amidst their tall ancestral trees,
O'er all the pleasant land." — MRS. HEMANS.

STANDARD BEARER.
STAZZI DUOMO FIORENZE ITALY

WHE Renaissance of Italy began to affect the architecture of England in the reign of Henry VIII, early in the sixteenth century,[2] but more imperfectly than in the coeval era of François Premier. Italy was then the cynosure of all eyes. Its arts, its universities and its learning magnetized travellers from the most distant countries. The age of Leo X was destined to mark a brilliant period in its history. At first progress here was slow, though guided, as in France, by imported foreign artists[3] and by the descriptions of travelled nobles. The amalgamation of the Italian, grafted as it was by the local artists on the later Tudor Gothic, produced but a bastard fusion. No ancient examples existed whereby to guide or inspire; we cannot wonder, therefore, at the rudely outlined imitations of Southern elegance. It had a certain charm, however, all its own. The condition of society permitted now the abandonment of the fortified manorial residence, while with the accession of Elizabeth in 1558, and during this and the reign of the first of the Stuarts, an immense impulse was given to the erection of large and costly houses containing apartments of great size. These were arranged round a central court, with the principal apartments looking outwards. The staircase became much amplified (owing to the chief rooms being upstairs), though retired in situation, and ultimately usurped the place of the hall, which from the days of the Saxons had formed an integral part of the feudal system, and had held the place of honor in every house. The source of inspiration was the Italian examples; the materials, the details, the execution were essentially English, influenced to some extent by Holbein and other artists of the Low Countries and of Italy. In plan, circular forms and straight flights between parallel walls were now abandoned in favor of the rectangular open newel. The balustrading below the hand-rails in early examples — as at Boughton Malherbe, Kent, and Leeds Castle, Kent, were filled up with plaster,[4] but later this gave place to the vigorously-carved work which formed so conspicuous a characteristic of Elizabethan art. The staircases were subdivided into broad, short, straight flights, with numerous quarter-spaces and landings surrounding a central well-hole. One is struck by their large size, their quaint picturesqueness and artistic composition, their massive newels, and their richly-carved balustrades. A pictorial eye governed the grouping, a vigorous hand the detailing, careful workers the solidity and substantiality, and a liberal owner the wealthy profusion of oak or chestnut material which nature had placed at disposal in such abundance. The balustrade and newel occupied at no other period a position of such conspicuous importance. Nearly all examples have massive, solid newels of bold design surmounted by vases, baskets of flowers, miniature statues, columns, lions or griffins on their haunches holding shields, carrying armorial bearings and such like, with pendants below frequently connected with the top of the finials immediately under. In fact, they form one of the chief decorative and constructive elements of the design. In the early example at Layer Marney Hall (1523) they run from bottom to top and are connected by arches. In Benthall Hall, Shropshire (1535), we see the curl-edged scroll-work butting between massive newels, with, as is usual, a very broad solid hand-rail capping the balustrade. Aubrey, in his oft-quoted description of Lord Bacon's "Verulam House," says, "in the middle was a delicate staircase of wood which was curiously carved; and on the post of every interstice was some pretty figure, as a grave divine with his book and spectacles, a mendicant friar, and not one twice." Bacon himself, in his interesting essay describing a "Princely Pallace," says, "The Staires, likewise, to the upper Roomes, let them bee upon a Faire open Newell, and finally raild in, with Images of wood, Caste into a Brasse Colour: and A very faire Landing Place at the Top." Let us imagine, then, a staircase of the period thus, with its quarry-glazed mullioned windows, its walls decorated with panelled wainscot, or the rich tapestry which had now come into general use, and hung with bow and firelock, armor, pike, and pistol, the ceiling and raking soffits covered with highly-enriched plaster-work of peculiar complicated scroll-work, with many pictures, and a lavish profusion of ornament, and we cannot help being filled with a sense of respect and admiration for the richness of fancy which produced a sight so peculiarly attractive to a pictorial eye, so thoroughly in harmony with the brilliancy of the age, and so emblematic of the national life in which they were created. The late Sir Sydney Smirke, in his "*Lectures*," advises us to avoid "the wantonness of design in these staircases;" but we cannot help thinking that they possess some admirable points, such as the picturesque composition, the air of homely grandeur, and the solidity of construction prevailing throughout, which we may take a lesson from with advantage.

The influence of Holbein, who favored the Italian *cinque-cento* style, and of John of Padua may be said to have been predominant from about 1524 to 1580. The transitional staircase at Burleigh House, Northamptonshire (c. 1570), which has a large solid newel surrounded by stone steps (a feature we also find at Montacute and elsewhere), was, therefore, a plan most naturally to be expected would be much used. The raking barrel-vault, the cross arches with the groined landings, having massive ribs and pendants all covered with ornament, show clearly an Italian influence, and possibly the handiwork of the talented author of Longleat, which was then in course of erection. Hardwick Hall (c. 1590–97) has also a stone stair of immense size. The great bulk of the staircases, however, were of timber disposed round an open newel. Westwood House, Warwickshire, and Wakehurst, Sussex (c. 1590), are interesting, principally from the newels of the former being surmounted by complete Corinthian pillars having ball finials, while the latter is inclosed in a curious pilastered case.

The staircases of James the First's reign form a remarkably interesting and important group. Hatfield, by Thorpe (1605–11), stands out pre-eminent amongst the earliest and finest oak stairs of this reign existing. It measures about 21′ x 35′, and is comprised of five flights of steps. The newels, ornamented with delicately-carved arabesques, are crowned with armorial lions and miniature statues. The balustrade is formed of termini, with small connecting arches such as we find at Audley End, Essex, by Bernard Jansen and Thorpe (1603–16), an example in which scroll-enriched newels run from bottom to top, and Claverton, Somersetshire (1628). Shaped-hanging scroll-work under the stringer, the hatch-gate, the ornamental soffit in plaster-work, and the usual repetition of half the balustrading on the wall side, all combine to make a beautiful and representative example. Knowle, Kent, presents, with its double tier of superposed pillar newels and flat pointed arches, a rich and effective staircase of the period. In Holland House (1607), the Italian influence is strikingly seen in the rusticated balusters arched between, the ornamented stringer with its painted scroll decoration, and the broad cornice rail. At Ham House, Surrey (1610), we have a rich walnut balustrade filled with carved representations of armor and military trophies. At Charlton House, Kent, by Jansen (1607–12) — about the last of the foreign artists — there is one of massive chestnut; Lyveden Old Building presents us with a characteristic Jacobean example; Forde House, Devonshire (1610), Blickling Hall, Norfolk, and many other instances exhibit in their leading features the staircases of this period then erecting in England. Early in Charles the First's reign we have Aston Hall (1618–35), a fine staircase with a profusion of characteristic ornament; but perhaps the best is the somewhat similar one at Crewe (1615–36), where, in a space only 24 feet square, has been constructed "one of the most beautiful examples of the Transitional era, of excellent design and sound construction."[5] At Aldermaston, Berks (1636), we have another remarkably effective and highly enriched specimen of Charles the First's time. The newels are capped with large symbolical figures, and here we have also the hanging scroll-work and half balustrade against the wall we noted as at Crewe and Hatfield. The balustrade shows the decline in the style which commenced in this reign, the grotesque animals and figures holding shields and ornament, which we see in the still more debased

[1] The Institute Prize Essay, 1884, by Thomas Purves Marwick, A. R. I. B. A., published in the *Building News*. Continued from page 309, No. 444.

[2] In 1518, when Torrigiano was employed by the king on the monument of Henry VII.

[3] See Sir Digby Wyatt's book "*On the Foreign Artists Employed in England during the Sixteenth Century.*"

[4] Parker's "*Glossary.*"

[5] Prof. Barry's lectures.

illustration from Rawdon House, Herts, where it is filled with hideously grotesque monsters. The best period had now passed, but the influence of the picturesque Elizabethan staircase, which in spirit was an essentially Gothic construction, died slowly. So late as the Commonwealth we see it in the staircase in Cromwell Hall, Highgate, where the newels are, as usual, surmounted by bold finials, and on the top are dwarf representations of the soldiers of Cromwell's army. The balustrade of thirteen bays is boldly designed, and carved with panels of military weapons, shields, festoons, and the usual interlaced strap-work derived originally from Germany and the Netherlands. From early in Henry the Eighth's reign to Longleat formed the first moiety of the Transition; Longleat to Whitehall the second. The latter period was but half a century, yet no subsequent epoch possesses an interest equal to this when Elizabethan or Jacobean art was at its best. We proceed to notice the development of a purer, if less pictorial style.

THE RENAISSANCE.

With the advent of Inigo Jones commenced the purer phase of the Renaissance. From its first incipient stages the traces of Italian influence had become more and more emphasized. Jones returned from his second visit to the South (1612) a thorough Palladian disciple, and he led Palladianism to the front, where it remained for a century and a half,—until after the publication of Stuart's "*Athens*," in 1762. The houses under his influence became copies of Italian villas, cubical blocks without courts, the offices in a basement instead of being brought into touch and harmony with the surrounding landscape, and a total contrast to those immediately preceding in the reign of Elizabeth and the early part of the reign of James I. Symmetry and formalism, porticos and colonnades, were now substituted for the domestic convenience and irregularity of the Elizabethan mansion. The staircases were dressed in Italian costume to match, and planted in a conspicuous situation so as to be seen and form a stately approach. Timber was still greatly used, and the quality of the workmanship was admirable. The staircases designed by Jones stand out pre-eminent for beauty and solidity of construction. The finest is undoubtedly that leading from the entrance hall to the first floor of Ashburnham House, Westminster[1] (*c.* 1650), which has been illustrated by Ware, Britton, and Pugin, H. W. Brewer, and latterly by the Institute measured drawings. Sir John Soane, who was a great admirer of this architect's staircases, had also careful drawings of it prepared, which he frequently brought under the notice of students, in his Royal Academy lectures, recommending it to their very careful study.[2] It is composed of four ranges of steps, occupies a space of only 23 feet square, and is 43 feet to the top of the beautiful oval lantern and gallery. This lantern is the charming feature of the composition. It is surrounded by twelve small Ionic columns in triplets resting on a deep coved entablature. The lower portion of the walls are richly panelled and subdivided by fluted Ionic pilasters.[3] The balustrade is composed of regular balusters horizontally moulded, and all the details except the ceiling are of wood constructed largely out of the solid, and put together where necessary with wooden pegs. The whole composition is an example of exquisite proportions and refined delicacy of taste. The staircase at Ambresbury, Wiltshire (*c.* 1661), we have had occasion to refer to in a previous part of this paper as containing a service-stair within the circumambient principal. As Jones died in 1652, the actual execution was carried out by his nephew and pupil Webb. It measures about 18 feet square, the balusters similar to those in Ashburnham House, but slightly enriched and surmounted by a massive cornice butting between enriched pedestals. In the illustration here given from Chandos Street, Westminster, we note the balustrade filled with carved running scroll-work of leaves, fruit and flowers, somewhat similar in style to that from the old house in Greenwich, of date about 1640. Towards the latter end of the seventeenth century we find the balustrades filled with this carved scroll-work of intricate and elaborate design, interspersed with figures and animals concealing themselves among the leaves and branches. The staircase from Belsize House, Hampstead, an interesting old building long since demolished, is a good specimen, and is herewith illustrated.

Of eighteenth-century staircases we have little to say that is not already well known. Some we find remarkably mean and steep, others uselessly large, all generally cold, tame, and expressionless in design compared with those we have been considering. In arrangement they naturally followed the Italian distribution and were placed in the central hall, where a grand and striking approach, in opposition to the domestic convenience and comfort of Elizabethan plan, was considered the one thing desirable. Oak was largely employed—often cut out of the solid—in massive newels and huge ramped handrail and stringer cornices. Iron balustrades were also in use, and gave a lightness of design very different from the work of James I. Wren's influence completed the change Jones had commenced; his staircases were substantial structures with good details and carving. The stairs leading to the upper stages of his towers were generally in an angle, the projection being shown on the inside, as at St. Stephen, Walbrook, and St. James's, Garlick Hill, while the great central spiral stair of St. Bride, Fleet St. (1680), and the circular geometrical staircase in the South Tower of St. Paul's are well-known specimens of his constructive talent. His pupil, Hawksmoor's (1666–1736) manner is well shown at Easton Hall, Kent. Vanbrugh (and his great staircase at Blenheim) and the correct classicality of Chambers land us at Fonthill. With the mention of Soane's Scala Regia,[4] the British Museum staircase by Smirke, and Barry's Peers' Staircase—as illustrative and representative of the staircases of one of the phases of that revival originating with Wyatt, which has succeeded in retaining the longest possession of the field in this "Age of Revivals"—we regretfully take leave of a branch of our subject worthy and capable of much interesting enlargement. Our historical notes of the staircase in other countries must perforce now be exceedingly brief.

SCOTLAND.

Remotely situated, inhabited by a people neither possessed of the means or opportunities of cultivating the art of architecture, Scotland advanced but slowly along the track marked out by the firmly progressive castles of England. The early keep was invariably entered by a wooden ladder or movable outside stair for drawing up, while access to the upper floors was obtained by a circular or straight flight of steps in the thickness of the wall, much as we find in England, though naturally, from the unsettled condition of society this form of building continued to a much later date. The War of Independence led to that Franco-Scottish alliance which—fostered by Charles V and VI of France in the many privileges given to the sons of Scottish barons serving on the famed "Body-Guard"—ultimately resulted in everything politically and socially, as well as architecturally, becoming imbued with French ideas and forms. Subsequent to that, and especially during the sixteenth and seventeenth centuries up to the time of the Commonwealth, Scottish architecture, instead of deriving its influence from the great English centres, drew it from France. In place of the Perpendicular phase of Gothic, therefore, we find the Flamboyant; in place of the Elizabethan we find adaptations of the French Châteaux of the sixteenth century. This grafting of French—with the crow-stepped gables of Flanders—on to the native castellated produced that peculiarly bold, unrefined, yet thoroughly characteristic, Scottish Baronial style, of which the distinguishing features are the great number of turrets and towers, the stepped gables, the ranges of pedimented dormers, and the bold corbellings, forming picturesque groups, harmonizing well with the rugged and mountainous character of the scenery, amid which the castles were usually planted. The fusion with the Renaissance becomes earlier noticeable than might have been expected. Mixed up with the Gothic, the interlaced strap-work of the Elizabethan, and the leading features of the Baronial style it produced such work as we see in Heriot's Hospital (1628–1642), Wintoun House, and Glasgow Old University.

Outside staircases with close stone parapets on one or both sides, were very common in the domestic architecture of towns, but seldom possessed any prominent feature of interest. Where running up alongside a wall the landing was usually supported on a plain or chamfered pillar to give access to the door below. Internal staircases were invariably circular on plan, except in late examples when the parallelogram came into use. Where attached to the upper stories of towers, in corbelled rocket-shaped towers of simple detail to afford access to the various floors and roof, it is usually carried up and capped with a conical or ogee-shaped top, such as we see in French examples. Elsewhere they generally project from the face of the wall, or occupy an internal angle, are circular or polygonal outside, rise from the ground, and have a separate, tower-shaped roof. In old town houses this feature of a circular projection on the back wall containing the stair, serving all the upper floors of a tenement continues even to this day. It is a common feature also in the domestic architecture of Flanders. With advancing ideas and the more settled state of society in the sixteenth century, we find the diameter of the stair enlarged and the "going" eased, as in the example at Fyvie Castle, Aberdeenshire.[5] The very long steps used here are supported on a series of triangular stone vaultings springing off cross arches from newel to wall. The staircase leading to Queen Margaret's Bower, Linlithgow Palace, shown by one of our lithographic illustrations this week, presents us with an elegant specimen of the newel being carried up, from which spring the ribs of the roof-vault. The staircase of Burgie Castle (1567) shows level radiating ribs carrying a flat roof. That the means of defence were seldom overlooked in this country, we see in the large staircases at Noltland Castle, in the remote Orkneys, and in Careston, Forfarshire, where shot-holes are provided for defence in the event of an enemy gaining possession. For this purpose, also, staircases were in some instances placed in different parts of the building in place of running from bottom to top, and had thus to be stormed separately. At Glamis Castle, Forfarshire (1689), the hollow newel we have had several occasions of referring to was used as a well, service-doors being introduced at each floor. Externally the staircase towers had doorways surrounded by boldly-outlined mouldings, often partaking of a French character. The windows were most usually plain moulded until the Italian influence

[1] This has been lately ascribed to Webb. Jones, like Thorpe, gets the credit for a considerable amount of doubtful work.

[2] Sir John says: "Inigo Jones, whose superior knowledge in architecture I have often mentioned, was particularly happy in his staircases, both as to convenience and artistic-like effect, even when confined to very small spaces. How superior is the decoration in his stairs to modern houses of similar class. What comparative magnificence in the former, what poverty and meanness in the latter! Whatever we have gained in lightness and effect, we have lost in importance and character."

[3] Jones usually gave a marked entasis to his columns, a peculiar feature he imitated from Alberti and others, and which Sir Hy. Wotton says makes columns look "as if they were sicke of some Tympany or Dropsie, unseemly to the very judgment of sight."

[4] Illustrated in Britton and Pugin's "*Public Buildings of London.*"

[5] Supposed to be the largest circular stair in Britain.

became felt, when they were decorated with rude pilasters and cornices, and surmounted by pediments of ornamental scroll-work.

GERMANY.

The tide of architectural art in Germany ebbed and flowed in sympathy and unison with that of adjoining countries. In ecclesiastical structures we find the staircase from early times forming an important factor in the external design. It, of course, was circular on plan, the inclosing walls being usually square or polygonal, carried up into a lofty tower and crowned with a pyramidal roof. It was here that these features first originated. The elegant quartette of staircase towers at Spires (1030–61), which lend so picturesque a charm to the design; the four at Worms (*c.* 1110), towering 200 feet high, and which so agreeably break up the sky-line; those at Mayence, at Laach, and at Aix-la-Chapelle, are sufficient to show the important position in grouping assigned to the staircase tower in the ecclesiastical structures of mediæval Germany. Of open examples we cannot point to more exquisitely elaborated turret-staircases than those at the four angles of Strasburg's mighty tower (1277–1439). In Mayence Cathedral there is one similar to those previously detailed at Laon and Rheims. In Naumbourg (1249–72), in the screen across the west choir and giving access to the loft over, are two elegant internal spiral staircases inclosed in open cage-work of pillars and arches. It is needless, however, to farther multiply instances. Those mentioned, with Ulm Minster, Prague, Treves, Hildesheim, and many others sufficiently exemplify the importance, the grace, and the beauty which the architects in Germany — whether native or foreign — constantly endeavored to give to this feature in their cathedrals and churches. The first decided symptoms of the change to the Renaissance began towards the middle of the sixteenth century. A good example of an external staircase about the end of this century is that at the Town-Hall of Lübeck. It is a single flight along the wall, giving access to the first floor, the steps being carried on groining springing off elliptic arches. The richly-carved balustrade and wood inclosure are ornamented with termini and other details, bearing a resemblance to the work at Heidelberg and to that of the coeval Jacobean period in England. The public halls of the sixteenth century were usually on the first or principal floor, approached by a single external stone staircase. Occasionally, however, these were double, as at Dettelbach and Volbach. For the application of the staircase in ordinary domestic architecture, we naturally look to quaint Nuremberg, the centre of Germany during the Middle Ages, both in arts and commerce. The turrets containing the usual circular stair form well-known features, are carried up from the ground or corbelled out, sometimes vaulted all under the steps, crowned with a steep roof, and always forming picturesque and pleasing features wherever used. In early examples we find them polygonal on the outside; but, with the changes of style, we notice them become circular, as, for example, in a house in Hirochelgasse, Nuremberg, of date 1540. The later Renaissance is well illustrated by Neumann's staircase (1720–44) in the Palace Würzburg, Bavaria, a stately and noble specimen. The approach is by a broad central flight between two rows of marble columns carrying the groining of the two upper flights, which branch to right and left. The era of Revival — fostered as it was by the munificence of Ludwig I of Bavaria — has done much for the development of grand staircases of colossal size. Schinkel's striking double flights in the portico of the Museum at Berlin,[1] Fergusson says, make it the best portico of any erected in modern Europe, "as the stairs give meaning to the whole and there are no windows in shade." Immediately in the rear is Stüler's[2] vast and magnificent staircase, which measures about 100 feet by 50 feet, and to which Sir William Tite has awarded the highest praise. Demmler's circular staircase in an internal angle of the pentagonal palace of Mecklenburg-Schwerin (1844–57) is also interesting. The steps are of black marble supported at both ends on cast-iron pillars. The landings surround the stair, and have pillars and arches tier over tier, the whole construction being surmounted by a lofty stone-vaulted cupola. The principal staircase in the Town-Hall of Buda-Pest, Hungary, by Von Dett, we mention for its effective artistic treatment of constructional iron-work, of which — with the exception of the Kärst-marble steps — it is wholly composed. The Royal Palace at Munich has a handsome example; but the finest in that city is Gärtner's, in the Public Library, Ludwig Strasse. It consists of a broad, well-broken flight of steps, having on each side of the upper landing a colonnade of marble columns supporting a barrel-vaulted ceiling, magnificently decorated with chaste, harmonizing, allegorical frescos of great beauty.

SPAIN.

The staircases of Spain possess no originality warranting detailed analysis. The forms, like the architecture generally, were borrowed from neighboring countries. We will only instance a few prominent examples. In ecclesiastical architecture the best known is that by Diego de Silve in the north transept of Burgos Cathedral. It consists of five flights of steps, giving access to the church from a high level, and is of a most elaborate character, though somewhat spoilt, says Waring, by a confused and unmeaning iron railing. The ascent of the tower of Santiago Cathedral is by a stair carried all round between the outer and the inner wall, the central space being used as a succession of rooms one over the other. In the celebrated Giralda tower the space between the walls is 23 feet, and the ascent by inclined planes, as in the contemporary campanile at Venice, and may be easily performed by two persons on horseback.[3] The late George Edmund Street, in his "*Gothic Architecture in Spain*," mentions a curiously constructed newel stair in Tarragona Cathedral (1175–1250), an example which we cannot remember ever having before met with. "The central cylinder is 18 inches diameter, in stones 2 feet 3 inches high, each stone having three corbels with sockets for the steps wrought on; the steps being thus supported by the newel, and yet independent of it." In the secular architecture of the Renaissance era Spanish work was largely indebted to Italy, the spring from which the leading ideas were mainly drawn. The arcaded patio or courtyard which formed the leading feature in the plans of all large houses was but the *cortile* of the Italian *palazzo*. The staircases were usually open, invariably rectangular, and afforded access to the upper arcade, whence the rooms were entered. Sir Digby Wyatt has given several sketches of these, such as that in the Casa del Infantado at Valladolid, the Casa de las Conchas, Salamanca, and that from a house in the Calle de Moncara at Barcelona. "The most remarkable feature about these staircases," says Sir Digby, "is the dome-work of wood which covers them at a level with the roof, which is formed of complex panelling, inlaid with foliage and geometrical figures." The Gothic staircase, of date 1436, in the Casa de la Deputacion at Barcelona — the *patio* of which has three tiers of arches in place of the usual two — runs up alongside a wall, and has a close parapet, ornamented with circular traceried panels, the steps being outwardly profiled and resting on a long flat elliptic arch. In Mr. B. Smith's recently published "*Sketches*" are some characteristic staircases as, *e. g.*, that in the Casas Consistoriales at Granada, by Herrera, (*c.* 1584), and that in the Casa Zaporta at Saragossa, which is an exceedingly dainty specimen, having a sculptured close balustrade, and an elegant arcade at the level of the upper landing. One of the finest of all we have cited, however, and perhaps in Spain, is undoubtedly that in the *cortile* of the Hospital of the Holy Cross at Toledo, by Henrique de Egas. It is in the "Plateresque" or early Renaissance style, of date about the beginning of the sixteenth century. The balustrade is formed of double-bellied balusters, butting between circular diapered pillar newels with carved capitals and surmounted by vases. From the landing, looking back towards the richly-arcaded patio beyond and above, we view a most picturesque, effective, and thoroughly artistic composition. The later debased Renaissance, named by the Spaniards after Jose Churriquera, its apostles, "Churrigueriśimo," is typically illustrated in an example at Barcelona. Here the columns are twisted, with raking elliptic arches over, and a carved balustrade between the pedestals. The whole is pleasing enough in general design, but in detail of very questionable taste.

RUSSIA.

The double staircase in the palace of the Archduke Michael at St. Petersburg, by Rossi, in 1820, occupies an area of no less than 6,400 feet, and is a most elaborate production; but by far the handsomest modern erection of this kind is that built in 1838 by Kleuze, in the Museum of Fine Arts. It is a straight stair measuring about 130 feet by 50 feet, and consists of three continuous flights, each of 21 Carrara marble steps 22 feet broad. As in the example at Munich, it is flanked on each side of the upper floor by a colonnade, composed of 10 Corinthian columns, and has a deeply-coffered ceiling.

BELGIUM.

We would only mention one peculiar feature of the sixteenth-century staircase-towers at Bruges. These were of varied design, always carried to a considerable height, and were used principally as observatories from which the foreign consuls and merchants could witness the arrival and departure of vessels.[4]

CONCLUSION.

We have thus, in a rapid historical survey, traced our subject in its natural sequence from its earliest inception onwards through what Ruskin calls the "trinity of ages;" the classical age to the fall of the Roman Empire, the mediæval age to the close of the fifteenth century, and the modern age to the present time. As "Invention is nothing more than a new combination of ideas from time to time stored up in the mind,"[5] a consecutive account of the ideas of those who have gone before may be of some utility. We must now examine a few practical considerations which, perhaps, from the attractiveness of our subject hitherto have been already too long delayed.

[1] Illustrated in Schinkel's works.
[2] Gold Medallist, R.I.B.A., 1858.

[3] Gwilt.
[4] R.I.B.A. "Proceedings" for 1856.
[5] Sir Joshua Reynolds.

THE BARTHOLDI STATUE: A FRENCHMAN'S VIEW OF THE SITUATION.

M. LOUIS LEROY has written in *Charivari* on the subject of the Bartholdi statue in rather an amusing strain. He says that although General Grant, who was President of the United States in 1871, addressed the Emperor of Germany a letter of sincere congratulation soon after the war upon the brilliant way in which he had conducted it and brought it to a close by dethroning Napoleon III, and seizing two French provinces,

yet this unfriendly feeling on the part of a sister republic had not caused the French to show any resentment. They had continued to wish prosperity to the United States, and in proof of their regard had offered them a colossal bronze statue — Liberty Enlightening the World.

It was thought that the slight differences between friends could be smoothed over by so appropriate a present. M. Bartholdi, a sculptor of approved merit, was selected to carry out the wishes of the subscribers to a work of art of so great importance. To-day this work is happily finished. According to general opinion this colossal statue, unique in the world, in the nose of which two or three persons are able to move about at ease, is a grand monument of the artistic skill and ability of our time.

We have left, he says, to the care of our American brothers the construction of a proper pedestal for this statue—a mere trifle in comparison with the importance of the figure which it is intended to support.

But the Americans exhibit the coldness of desolation in doing their share of the work. The subscription is far from being covered. They lay down millions at the feet of ballet-girls and the divas of comic-operas, and they are not able to decide upon furnishing the foundation of the pedestal. Let us see. It only needs a little courage on the part of that devil, the pocket. Once put the statue in place, and be assured that you will be quite satisfied with the effect.

Perhaps your hesitation proceeds from the difficulty of demanding of us the 30 per cent of customs dues which you have imposed upon works of art of French production?

Oh! if that is all, we will pay the customs dues. But if only the dollars which you hold so dear to your heart had the power of speech, they would themselves urge you to raise the necessary amount to construct the pedestal.

It is very comical that Americans should pay so dear for the warblings of Patti, and show this parsimony with regard to a statue of Liberty Enlightening the World. Do then as she does, ungrateful sons. Enlighten us.

Do not be embarrassed by the sympathy of Grant with the Prussian arms. We only wish well to that excellent General, and are perfectly reconciled with him.

Our Government has associated itself with the subscribers to the statue, and has courteously placed a man-of-war at their disposal to transport the gift across the Atlantic. If, however, you have placed obstacles in the way of its reception, it might be well not to send it to you at all.

And here is an idea! Suppose the good female should remain in France? Do you not know that she would appear as well upon the piers of Havre as in the bay of New York? She would then enlighten France instead of America, and we should be all the better for it. On reflection, it is a very foolish thing to wish to impose a gift upon those who are unwilling to receive it.

Take my advice, brave Yankees, and refuse the gift. It is such a mass of metal that it would never be able to pirouette like a ballet-dancer. You saluted the debarkation of Fanny Ellsler with salvos of artillery; but this grand dame Liberty is so deaf that you need not do so much for her.

Let her stay here, and you are promised an exceptional festival. We know as much of liberty as yourselves, and we have an artistic aptitude which absolutely fails with you. Your young painters know something of it, since they come in crowds to sit at the feet of French masters. You may retain the foundations of the pedestal and we will keep the bronze.

But never forgetting our courtesy, the few American subscribers to the pedestal shall be favored with invitations, and it will be a rare feast to listen to the speeches which will be delivered on the day when, in old France, there will be unveiled a Liberty which young America did not want.

POSTAL-RATES ON DRAWINGS.

Boston, July 4, 1884.

To the Editors of the American Architect: —

Dear Sirs, — The postal-rates for transmission of drawings in England and Canada is the same as for printed matter; but in the United States the rate for sending a drawing is the same as that charged for letter postage. I have repeatedly received drawings on which the prepaid postage was the same as that charged on books, and I know parties who send drawings and never pay letter-rate for them. If a blue-print of a drawing is made, the print can be sent as second-class matter. I have thought over this subject for some time, and I fail to see why the high rate on drawings is retained. It certainly diverts a good amount of material to the express companies, and that is so much revenue lost to the government.

One naturally expects in the postal service some progression towards carrying letters, books, drawings, etc., at the cheapest possible rate. The parcel-post introduced in England last year was a step in the right direction, and in a country like this surely the postal department should not be behind the age.

The information given by clerks at the Boston office is not always reliable. I remember sending a heavy roll of drawings to England, which must have weighed more than a quarter pound, and in response to repeated asking I was told it was only six cents! On another occasion I presented a cabinet-size photo, addressed to Canada, and the clerk assured me the charge would be ten cents. I did not pay it, as two similar packages had been sent and delivered in Canada for two cents each, mailed from an office in the suburbs, where they positively told me the postage was two cents. Evidently some of the post-office clerks do not know their business.

I will be glad to have an expression of your opinion on the present rates charged for drawings. Yours, etc. G. D. B.

[It is an exceptionally able post-office clerk that can keep the run of the variation in the "rulings" of the Post-Office Department, and we do not wonder that different clerks give differing answers to the same question, or that rural post-masters transgress rules that are familiar to city officials. We often note with amazement the postage paid on drawings which arrive at this office: some are covered with stamps; others run the gauntlet in safety under the ægis of a single two-cent stamp. The law as it at present affects the transmission of drawings is plain and concise. It says: "Drawings, plans and designs, which were formerly rated as fourth-class matter, are now subject to letter postage." This rule took effect February 21, 1881. Our correspondents had better be cautious about sending "blue-prints" at less than first-class rates; for Paragraph 233 says: "When only a single copy of a reproduction by any other process than ordinary type, plate, and lithographic printing is offered for mailing, and it does not appear from internal evidence that it is being sent in identical terms to several persons, it is subject to letter rates of postage."

We believe strongly that the ruling against drawings as fourth-class matter is not wholly logical and is largely unjust. We know that most of the "rulings" of the Department are brought about by outside pressure, and we feel that this is a case where pressure could successfully be applied by the largest class aggrieved by the present law — that is, by the architects. If architects throughout the country will draw up and sign a remonstrance, and a request that drawings be restored to the fourth class, we shall be happy to transmit it to the Postmaster General, and will do all we can to assure its consideration. — Eds. American Architect.]

THE CAMBRIDGE ODD-FELLOWS HALL.

Boston, July 3, 1884.

To the Editors of the American Architect: —

Gentlemen, — We are aware that it has been said "to him that hath shall be given," etc., but we did not expect to see any of our work claimed for our large namesake. We refer to your reference of this date to the Odd-Fellows Hall, Cambridgeport, p. xiii, of this day's issue. We were under the impression that we were the architects of that building. We even dreamed that we attended the corner-stone laying, on one of the hottest days of the present season. Certain newspapers were under a similar impression as to the authorship of the design, as you may see by the enclosed slip. If you will kindly give us the evidence upon which you credit it to Mr. H. H. Richardson, we will try to adjust our faith to the evidence.

Truly yours, Hartwell & Richardson.

BRONZE CASTING.

Boston, July 5th, 1884.

To the Editors of the American Architect: —

Dear Sirs, — The article on "bronze casting" in the *Architect* of the 5th inst. contains a gross error. It states that in France all practical knowledge of the art of casting in bronze by the wax process was lost at the beginning of the present century. This statement is not true. If the words of the best French sculptors are true, and the bronze works of the last eighty years are worth anything as evidence, there has been a lively interest in wax-process bronze-casting, as well as in every other kind of casting, in France during the above mentioned period. It is true that at this time large statues are not often cast by the wax-process, though like difficult undertakings are successfully accomplished in casting large statues in one piece. The bronze-founders of to-day in France include some very able men, men who are filling the demands of many great sculptors, men who are not only familiar with the methods of the past, but are active students in one of the greatest arts. There is one founder in Paris, A. Gruet, Jne., who as a nobleman as well as founder, is alone sufficient to sustain the reputation of France as a country where great work in bronze-casting is kept in an enviable state of perfection. T. H. Bartlett.

"STORY" OR "STOREY."

Boston, July 7, 1881.

To the Editors of the American Architect: —

Dear Sirs, — What is your custom both in books and in the *American Architect* in spelling the word story, meaning the divisions of a house, as second or third story. Is it "story" or "storey"? A reply will greatly oblige Yours truly, W. G. Corthell.

["Story" is the American spelling the word; "storey" the English. — Eds. American Architect.]

THE ANTI-SIPHON TRAP,

Buffalo, N. Y., July 5, 1884.

To the Editors of the American Architect: —

Sirs, — Allow me to thank you for "Sanitary Plumbing," and to ask for further information with regard to the "Anti-Siphon glass-side bulb" trap illustrated (page 245, etc). Is it in the hands of any manufacturing house? Is it patented? Or can any plumber make it? If it cannot be purchased, can you obtain me a sample trap? Respectfully, Louis Bethune, *Architect.*

[The "Anti-Siphon Trap" is protected by patent, and the inventor is perfecting his arrangements for its manufacture, which we understand are nearly completed. At present no traps are ready for the market, and we do not believe that any samples can yet be obtained. — Eds. American Architect.]

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

301,080. OUTSIDE PIPE-CUTTER. — Elbridge F. Barnes and Lorenzo C. Strickland, New Haven, Conn.

301,087. AUTOMATIC MECHANISM FOR SANDING BRICK-MOLDS. — James A. Buck, Crescent, N. Y.

301,092. APPARATUS FOR GENERATING HEATING-GAS, ETC. — Solomon N. Carvalho, New York, N. Y.

301,099. DAMPER-REGULATOR. — Nelson Curtis, Newton, Mass.

301,106. MACHINE FOR BENDING TUBES AND PIPES. — Edward P. Follett, Rochester, N. Y.

301,109. SAFETY-GATE FOR FREIGHT ELEVATORS. — Robert Fyfe, New York, N. Y.

301,123. SHINGLE-SAWING MACHINE. — David F. Hunt, Antrim, N. H.

301,124. DEVICE FOR PREVENTING PERCUSSION OR WATER-HAMMERING IN PIPES. — Francis Hyde, Toronto, Can.

301,125. HOISTING APPARATUS. — Maximillian Jacker, Florence, Wis.

301,131. MOLD FOR BRICK AND RE-PRESSING MACHINES. — Geo. H. Kuntz, Belleville, Ill.

301,138. FIRE-ESCAPE. — John L. McDonald, Shakopee, Minn.

301,149. MIXED PAINT. — Henry C. Pettee, Vallejo, Cal.

301,151. STENCH-TRAP. — Herman Pietsch, Flatbush, N. Y.

301,153 HOISTING APPARATUS. — De Witt Clinton Prescott, Marinette, Wis.

301,155. BRICK-KILN. — John Puerner and William Haumerson, Jefferson, Wis.

301,157. WEATHER-STRIP FOR WINDOW-SASHES. — George P. Rasck, Des Moines, Io.

301,164. FRICTION-HINGE. — Robert S. Robson and John Loughrey, Cambridge, Mass.

301,172. SAFETY DEVICE FOR ELEVATORS. — Rudolph C. Smith, Yonkers, N. Y.

301,173. SCREW-DRIVER. — Charles F. Spencer, Rochester, N. Y.

301,213. SAFETY APPLIANCE FOR ELEVATORS. — Robert A. Chesebrough, New York, N. Y.

301,219. URINAL. — Isaac Davis, Trenton, N. J.

301,221. WEATHER-STRIP. — Wm. J. Devers, Providence, R. I.

301,224. COMBINED HINGE AND BLIND-FASTENER. — Warren Small Dwinel and Earl Pierce Mason, Providence, R. I.

301,230. VENTILATING SEWERS. — Wm. M. Green, Chicago, Ill.

301,231. CRANE. — P. Henry Griffin, Detroit, Mich.

301,247. GAGE. — Michael P. Leonard, Pittsburg, Pa.

301,252. ALARM-LOCK. — Alexander F. McCollam, Fair Play, Cal.

301,258. VENTILATOR. — Conrad Müller, Hamburg, Germany.

301,260. METALLIC CEILING. — Albert Northrop, Pittsburgh, Pa.

301,264. HOT-AIR FIREPLACE. — Doyel Pearson, Memphis, Tenn.

301,268. MEANS FOR CONNECTING PIPES TO BOWLS. — George E. Poole, New York, N. Y.

301,289. SASH-BALANCE. — Friend W. Smith, Jr., and S. Stuart Williamson, Bridgeport, Conn.

301,296. FIRE-ESCAPE. — Alfred A. Starr, Westfield, N. J.

301,303. DOOR-KNOB ATTACHMENT. — Thos. Taylor, South Norwalk, Conn.

301,310. DOTTING-PEN. — Louis T. Weiss, Brooklyn, N. Y.

301,339. BIT-BRACE. — William R. Clarkson, Buffalo, N. Y.

301,353. MANUFACTURE OF BRICKS. — William L. Gregg, Philadelphia, Pa.

301,362. WEATHER-STRIP. — John T. Hall, Zenobia, Ill.

301,367. FIRE-ESCAPE. — John S. Oram and Henry R. Dickerman, Cleveland, O.

301,388. DOOR-HANGER. — Edward T. Prindle, Aurora, Ill.

301,391. SIPHON. — John P. Reinecke, Pittsburg, Pa.

301,429. WINDOW-SHUTTER. — Ludwig F. G. Boeckelmann, Davenport, Io.

301,441. FIRE-ESCAPE. — Kasson Freeman, Grand Rapids, Mich.

301,453. BLIND-SLAT ADJUSTER. — Richard M. Martin, Minneapolis, Minn.

301,458. TRAP FOR LAVATORIES, ETC. — Charles F. Pike, Philadelphia, Pa.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report thirteen permits have been granted, the more important of which are the following: —

Geo. W. Donohue, 8 two-st'y brick buildings, n s Jefferson St., bet. Duncan Alley and Choptank St.; 10 two-st'y brick buildings, s s Jefferson St., bet. Chester St. and Duncan Alley; and 2 two-st'y brick buildings, e s Chester St., s of above.

Graham Gordon, 5 two-st'y brick buildings, com. s e cor. Light and Lee Sts., fronting on Light St.

Isaac Benesch, four-st'y brick building, w s Eutaw St., bet. Saratoga and Mulberry Sts.

Geo. E. Bay, 2 three-st'y brick buildings, w s Foster Alley, s of Lanvale St.

Wm. E. Wood & Co., 10 two-st'y brick buildings, s e cor. Sassafras and Cross Sts.

Geo. M. Gill, two-st'y brick buildings in rear, s e cor. Eutaw Pl. and McMechin St.

Boston.

MONTHLY REPORT. — During the month of June, 27 permits for brick buildings, and 109 permits for wooden buildings were granted at the office of Inspector of Buildings.

BUILDING PERMITS. — *Brick.* — *Carlton St.*, near Claremont Park, Ward 18, for John F. Mead, 3 dwells., 16′ x 36′, three-st'y flat; Oliver W. Patrick, builder.

Claremont Park, near Carlton St., Ward 18, for John F. Mead, 4 dwells., 19′ x 36′, three-st'y flat; Oliver W. Patrick, builder.

Appleton St., near Tremont St., Ward 16, for Joseph T. Bailey, manufactory, 47′ x 100′, four-st'y flat.

Commonwealth Ave., No. 229, Ward 11, for Wm. L. Richardson, dwell., 24′ x 81′, five-st'y flat; Woodbury & Leighton, builders.

Eliot St., No. 134, Ward 14, for Z. T. Hollingsworth, shops, 16′ 6″ x 19′ and 23′ 6″, three-st'y flat; Dewing & McClure, builders.

Wood. — Blue Hill Ave., cor. Columbia St., Ward 24, for John M. Way, store, 12′ x 16′, one-st'y pitch; D. B. Clemet, builder.

K St., No. 219, rear, Ward 14, for Arthur Deedy, greenhouse, 10′ x 12′ and 10′ x 16′, one-st'y pitch.

Heath Pl., near South St., Ward 22, dwell., 28′ 6″ x 36′, three-st'y flat.

Clifton St., nearly opp. Batchelder St., Ward 20, for Nellie E. Terhune, dwell., 21′ 6″ x 50′, two-st'y pitch; John Oliver, builder.

North Harvard St., cor. Western Ave., Ward 25, for H. Reed, dwell., 22′ x 34′, two-st'y mansard.

Bodwell Park, near Bird St., Ward 20, for Edw. McKechnie, dwell., 29′ x 30′, two-st'y pitch; Edward McKechnie, builder.

Orleans St., No. 69, rear, Ward 2, for Patrick Morrison, storage, 20′ x 50′, one-st'y flat; Paul Bayley, builder.

Savin Hill Ave., cor. Auckland St., Ward 24, for city of Boston, primary school-house, 14′ 9″ x 25′ 6″ and 32′ 10″ x 66′ 3″, one-st'y hip; W. H. Jobling, builder.

Geneva Ave., near N. Y. & N. E. R. R. Ward 24, for Frank M. Silva, 3 dwells., 21′ x 31′, two-st'y pitch.

West Cottage St., near Brook Ave., Ward 24, for W. W. Dromey, 2 dwells., 20′ x 31′, three-st'y flat; W. W. Dromey, builder.

Clifton St., near Cottage St., Ward 20, for Joseph Breckenbridge, 2 dwells., 26′ 10″ x 52′ 8′, two-st'y pitch; Hamilton Parks, builder.

Wise St., near Centre St., Ward 20, for Mary A. Cook, dwell., 24′ and 29′ x 30′, three-st'y pitch, John L. Dakin, builder.

Mayfair St., No. 15, Ward 21, for Sarah H. Wheelock, dwell., 21′ and 27′ x 32′, two-st'y pitch, Holmes Bros., builders.

Quincy St., near Blue Hill Ave., Ward 21, for Frank M. Silva, dwell., 20′ and 27′ x 31, two-st'y pitch.

Everett St., Ward 2, for Dennis Sullivan, dwell. and store, 20′ x 30′, two-st'y flat; Richard Costello, builder.

Brooklyn.

BUILDING PERMITS. — *Stuyvesant Ave.*, w s, 24′ n Hancock St., 4 three-st'y freestone dwells., tin roofs; cost, each, $6,000; owner, Benjamin Linikin, Greene Ave.; architect, Amzi Hill.

Sixth Ave., w s, 10′ s Nineteenth St., three-st'y frame tenement, tin roof; cost, $3,500; owner, M. McDonough, 341 East Twenty-second St., New York; architect, Geo. W. Bush.

Lawton St., n s, 250′ e Broadway, 2 two-st'y frame dwells., tin roofs; cost, each, $2,800; owner and builder, Geo. W. Jackson, 298 Lorimer St.; architect, John Herr.

Bedford Ave., Nos. 773 *and* 775, 2 three-st'y brownstone dwells. and stores, tin roofs; cost, each, $4,750; owner and carpenter, D. H. Fowler, 777 Bedford Ave.; architect, Amzi Hill.

Seventeenth St., No. 220 *A*, s s, 25′ w Fifth Ave., three-st'y brick dwell., tin roof; cost, $10,000; owner, Maggie Heins, 202 Seventeenth St.; architect, Arthur J. Stever; builders, P. J. Carlin and Dan. Ryan.

Locust St., n s, 231′ w Beaver St., 2 three-st'y frame tenements, tin roofs; cost, each, $4,000; owner and architect, John Kramer, 291 Floyd St.; builder, John Krueger.

Quincy St., s s, 330′ e Reid Ave., two-st'y brick dwell., felt and gravel roof; cost, $4,000; owner, J. Miller; architect and builder, A. Miller.

Division Ave., n e cor. Second St., four-st'y brick tenement, tin roof; cost, about $5,000; owner, Geo. C. Dreyer, 45 Division Ave.; architect, Amzi Hill; builders, Hadden & Kilduff and J. J. Brennan.

Tompkins Ave., w s, 110′ n DeKalb Ave., three-st'y brown-stone dwell., tin roof; cost, $9,000; owner, John Deterling, cor. De Kalb and Tompkins Aves.; architect, I. D. Reynolds; builders, P. Carlin & Sons and S. C. Whitehead.

Fulton St., s s, 450′ w Ralph Ave., 2 three-st'y frame stores and tenements, tin roofs; cost for both, $8,800; owner, Chas. Guthy, 1782 Fulton St.; builder, Jacob Pirrung.

Aberdeen St., n e cor. Broadway, 2 three-st'y frame stores and tenements, tin roofs; cost for both, $8,635; owner, John Bauman, 716 Madison St.; builder, Jacob Pirrung.

Vanderbilt Ave., e s, about 200′ n Greene Ave., two-st'y brick stable, carriage-house and dwell., tin roof; cost, $8,000; owner, J. C. Hoagland, 186 Quincy St.; architects, Parntt Bros.; builders, T. B. Rutan and Hart & Boyd.

Fourteenth St., n s, 95′ 6″ w Fifth Ave., three-st'y brick flat, tin roof; cost, $7,000; owner and architect, S. Moffit, Fourteenth St., near Fifth Ave.; builders, Wm. and Thos. Corrigan.

Fifteenth St., s s, 175′ w Sixth Ave., three-st'y brick tenement, tin roof; cost, $6,000; owner and architect, Dennis Crowley, on premises; builders, Wm. and Thos. Corrigan.

Seventh Ave., s e cor. Fourteenth St., 2 three-st'y brick stores and tenements, tin roofs, iron cornices; cost for both, $16,000; owner, Henry Hohn, 29 Coenties Slip, New York; architect, Adam Munch.

Eleventh St., n s, 100′ w Fifth Ave., 20 two-st'y brick dwells., tin roofs; cost, each, $6,000; owners, Rhodes & Reynolds, West Brookville, N. Y.; architect, Chas. Lincoln; builders, A. E. Reynolds and —— Bucanan.

Seventh St., s s, 220′ e Sixth Ave., 3 two-st'y brick dwells., tin roofs; cost, each, $3,500; owner, Samuel S. Squire, Eleventh St., near Seventh Ave.; architect and builder, C. B. Sheldon.

Norman Ave., n s, 20′ e Diamond St., 10 three-st'y frame (brick filled) tenements; also, *Diamond St.*, e s, 79′ n Norman Ave., three-st'y frame (brick filled) tenement; also, *Jewel St.*, w s, 79′ n Norman Ave., three-st'y frame (brick filled) tenement, felt, cement and gravel roofs; cost, each, $3,800; owner, architect and carpenter, David Atkin, 551 Lorimer St.; mason, John Hafford.

Locust St., s s, 100′ e Broadway, three-st'y frame (brick filled) store and tenement, tin roof; cost, $4,300; owner and builder, George Loeffler, 78 Jefferson St.; architect, H. Vollweiler.

Calyer St., No. 197, n s, 25′ w Leonard St., three-st'y frame (brick filled) tenement, gravel roof; cost, $5,500; owner, Mrs. A. C. Moore, 187 Calyer St; architect, F. Weber; builders, J. Reed and S. F. Bardett.

Grand St., s s, 300′ e Gardner Ave., three-st'y frame (brick filled) office and tenement, gravel roof; cost, $6,000; owner, C. B. Tuttle, 18 Bedford Ave.; architect, E. F. Gaylor.

Summit St., No. 7, s s, 75′ e Commercial Wharf, three-st'y brick shop, tin roof; cost, $3,000; owner, David Van Cleaf; builders, J. F. Nelson and J. A. Kelly.

ALTERATIONS. — *Clinton Ave., No.* 227, 2 three-st'y brick extensions, tin roofs; also entire front rebuilt; cost, $10,000; owner, B. M. Hutman, 289 Park Pl.; architect, R. B. Eastman; builders, Wm. Hazzard's Son & Co.

Clinton Ave., No. 525, two-st'y brick extension, tin roof, etc.; cost, $4,000; owner, Estate of D. A. Sanborn, 521 Clinton Ave.; builders, J. J. Bentzen and H. J. Smith.

Chicago.

STORE. — T. V. Wadskier, architect, has completed plans for a six-st'y store-building, cor. of Adams and Market Sts. To be 123′ on Adams St., 95′ 6″ on Market St., and 170′ deep with extension, Anderson pressed-brick, stone and iron finish, terra-cotta cornice; owners, C. M. Henderson, and C. B. Blair; cost, about $150,000.

BUILDING PERMITS. — J. Holbein, two-st'y dwell., 636 Nineteenth St.; cost, $4,500; architect, A. Bessler.

C. R. Hopkins, two-st'y dwell., 3263 Vernon Ave.; cost, $6,000; architect, Robert Rae, Jr.

U. P. Smith, 20 two-st'y dwells., 12-48 Graves Pl.; cost, $80,000; architects, Wheelock & Clay; builder, A. H. Lowden.

Western Ave. M. E. Church, church, cor. Western Ave. and Monroe St.; cost, $25,000.

Newberry Estate, 2 additional stores, 121-127 Kinzie St.; cost, $10,000.

J. Sollitt, three-st'y dwell., 819 West Jackson St.; cost, $10,000; architect, J. M. Van Osdel.

J. Johnston, three-st'y store and dwell., 27-29 North State St.; cost, $6,000; architect, H. Lord Gay.

A. Ruehl, two-st'y store and dwell., 2900 Butler St.; cost, $3,100.

L. Isaacson, three-st'y dwell., 188 North May St.; cost, $5,000; builders, Lund & Gilbert.

S. E. Johnson, two-st'y dwell., 458 Dayton St.; cost, $5,500; architects, Scott & Gage.

M. Downs, two-st'y dwell., 115 Seeley Ave.; cost, $4,500; architect, A. M. Coulton.

M. F. Ross, two-st'y flats, 52 Artesian Ave.; cost, $2,900.

M. Kerwin, three-st'y dwell., 117 Locust St.; cost, $3,200.

C. L. Jencks, 5 three-st'y dwells., 1924-34 Clark St.; cost, $12,000; architect, J. Speyer.

G. Gunderson, 2 three-st'y stores and dwells., 387-389 West Indiana St.; cost, $12,500; architect, G. Isaacson; builders, Geo. Lehman & Son.

C. B. Blair, six-st'y store, cor. Adams and Market Sts.; cost, $100,000; T. V. Wadskier; builders, C. & A. Price.

Wm. Matthei, three-st'y store and dwell., 5 Gurley St.; cost, $7,500; architect, Wm. Strippelman.

J. A. Heath, two-st'y dwell., 3228 Prairie Ave., cost, $7,000; architect and builder, J. A. Heath.

H. Hellberg, two-st'y store and dwell., 935 Milwaukee Ave.; cost, $5,000.

H. A. Bliss, two-st'y dwell., 3350-52 Wabash Ave.; cost, $15,000; architect, Robt. Rae.

C. M. Henderson, six-st'y store, 237-39 Adams St.; cost, $40,000; architect, T. V. Wadskier; builder, W. Barton.

C. S. Bonney, two-st'y dwell., 1127 Genesee St.; cost, $5,000.

Mrs. Potter Palmer, three-st'y dwell., 64 Cedar St.; cost, $8,000; architect, J. S. Silsbee.

C. L. Gribenow, three-st'y store and dwell.; cost, $6,000; architect, C. L. Berlin.

G. Schmid, 2 two-st'y dwells., 46-48 Bellevue Ave.; cost, $7,000; architect, J. H. Huter; builders, Augus & Gundler.

L. Longprof, two-st'y flats, 521 North Ashland Ave.; cost, $4,000.

Seaman, Cox & Brown, three-st'y addition to factory, 147 Hoyne Ave.; cost, $6,000; builder, J. S. Price.

Erring Womans' Refuge, three-st'y store and dwell., 219-21 Thirty-first St.; cost, $12,000; architect, L. B. Dixon; builder, W. L. Crilly.

Wm. Ward, two-st'y dwell., 2108 Butterfield St.; cost, $3,000; builder, E. McDonald.

T. Stevenson, two-st'y dwell., 144 Barber St.; cost $2,500; builder, Peter Young.

Cincinnati.

BUILDING PERMITS.—Lawrence Grace, two-st'y brick dwell., cor. Coleman and Dayton Sts.; cost, $7,000.

C. Lougel, four-st'y brick dwell., cor. Pearl and Ludlow Sts.; cost, $3,500.

Nic Wolf, four-st'y brick dwell., cor. Second and Ludlow Sts.; cost, $3,500.

E. Schnidhad, three-st'y brick dwell., cor. Findlay and Pleasant Sts.; cost, $2,500.

Procter & Gamble repair three-st'y brick dwell., cor. York and John Sts.; cost, $2,800.

Jos. Ausdermore, two-st'y brick dwell., 253 Browne St.; cost, $5,000.

Mrs. Grave, three-st'y brick dwell., 76 Martin St.; cost, $3,800.

Jas. M. Glenn, four-st'y brick dwell., cor. Sixth St. and Broadway; S. Hannaford, architect; cost, $14,000.

F. Wibbelman, three-st'y brick dwell., cor. Liberty and Cutter Sts., for Catholic Church; cost, $9,900.

A. J. Hickenlooper, two-st'y brick dwell., 116 Dayton St.; cost, $4,000.

St. Anthony's Church, one-st'y brick school, cor. Budd and Carr Sts.; cost, $5,000.

Six permits for repairs, costing $5,000.

Total permits 17; cost, $49,400.

Total permits to date, 479.

Total cost to date, $1,785,185.

New York.

HOSPITAL.—The American Veterinary Hospital proposes to build a college on the n s of Sixty-fourth St., 375′ w of Eighth Ave.

APARTMENT-HOUSES.—For Mr. A. C. Hassey, an apartment-house, 52′ x 107′, is to be built on the n w cor. of Second Ave. and Eleventh St., from designs of Mr. Arthur Crooks.

For Alice Golding, a four-st'y flat, 20′ x 45′, at No. 235 West Thirty-eighth St., from designs of Mr. W. H. Smith.

OVERPRODUCTION OF BRICKS.—A large meeting of the brick manufacturers of New York and New Jersey was held July 8 in this city, and by a unanimous vote it was decided to reduce the supply to the present demand, and thereby enable the trade to save themselves from future loss. It was also decided to create a permanent organization of brick manufacturers.

BUILDING PERMITS.—*Fifty-fifth St.*, s s, 100′ w Sixth Ave., four-st'y brick, terra-cotta and brown-stone club-house and studio, fire-proof block roof; cost, about $55,000; owner, A. H. Barney, 10 East Thirty-eighth St.; architect, R. H. Robertson; builders, K. Deeves and Jeans & Taylor.

Tenth Ave., w s, 100′ n Sixty-fourth St., five-st'y Connecticut brown-stone tenement, tin roof; cost, $19,000; owner, John L. Miller, on premises; architects, Thom & Wilson; mason, G. A. Zimmermann.

Madison Ave., e s, 50′ s Seventh St., four-st'y brick and brown-stone dwell., tin roof; cost, $35,000; owner, Mayer Sternberger, 41 East Sixty-seventh St.; architects, Thom & Wilson; mason, I. A. Hopper.

West Forty-eighth St., No. 494, five-st'y Connecticut brown-stone tenement, tin roof; cost, $21,000; owner, Charles Gahren, 111 East Seventy-third St.; architects, Thom & Wilson.

Thirty-first St., n s, 60′ w Seventh Ave., five-st'y brown-stone apartment-house; cost, $25,000; owner, Jas. W. Silleck, Peekskill, N. Y.; architects, Thom & Wilson; builders, S. Lowden and T. J. Duffy.

West Thirteenth St., Nos. 7, 9 *and* 11, five-st'y brick (Ohio stone trimmed) store and lofts, tin roofs; owner, M. S. Van Buren, 21 West Fourteenth St.; architect, F. S. Copley.

Fourth St., s s, 42′ e Second Ave., 2 two-st'y brick stores and dwells., tin roofs; total cost, $3,000; owner, Robert F. Smith, 201 Broadway; architect and builder, Jno. B. Wilson.

Twenty-sixth St., n s, 188′ e Seventh Ave., 3 five-st'y brick tenements, tin roofs; cost, each, $20,000; owner, John Totten, 240 West Forty-ninth St.; architect, G. B. Pelham.

Tenth Ave., w s, 20′ s Sixty-first St., five-st'y brown-stone store and tenement, tin roof; cost, $15,000; owner, John Richards, 406 West Fifty-eighth St.; architect, L. Ungrich.

Seventy-fifth St., s s, 217′ 3″ w Ave. A, five-st'y brick tenement, tin roof; cost, $20,000; owner, Annie E. Kelly, 203 East Sixty-ninth St.; architect, G. A. Schellenger.

East Sixty-first St., No. 252, four-st'y brick and brown-stone tenement, tin roof; cost, $14,000; owner, architect and builder, Thomas Crimmins, 1151 Park Ave.

One Hundred and Thirty-second St., s s, 425′ e Eighth Ave., 5 three-st'y brown-stone dwells., tin roofs; cost, $10,000; owner, Walter S. Price, 33 West One Hundred and Thirty-first St.; architects, Cleverdon & Putzel.

West Forty-fourth St., Nos. 312–320, 5 five-st'y brick and brown-stone dwells., tin roofs; cost, each, $15,000; owners, James Kyle & Sons, 137 East Fortieth St.; architect, James Kyle.

One Hundred and Twenty-seventh St., s s, 212′ 6″ e Seventh Ave., 4 three-st'y sandstone dwells., tin roofs; cost, each, $9,000; owners, Adelaide and Ethelbert Wilson, 267 West Twenty-sixth St.; architect, J. F. Miller; builder, E. Wilson.

Seventieth St., 125′ from Fourth Ave., 3 five-st'y and basement brick and brown-stone dwells., slate and tin roofs; cost, each, $18,000; owner, Union Theological Seminary, E. M. Kingsley, Treasurer, 30 Clinton Pl.; architects, W. A. Potter and J. B. Lord; builders, Norcross Bros.

One Hundred and Fiftieth St., s s, 350′ e Courtland Ave., four-st'y brick tenement, tin roof; cost, $6,000; owner, Franz Knab, 139 East Third St.; architect, A. Arctander.

One Hundred and Twenty-third St., s s, 75′ e Seventh Ave., 7 four-st'y and basement brown-stone dwells., tin roofs; cost, each, $10,000; owner, A. Alonzo Teets, 208 West One Hundred and Twenty-fifth St.; architect, J. H. Valentine.

Ave. A, w s, 103′ 2″ n Eighty-first St., 2 five-st'y brick stores and tenements, tin roofs; cost, each, $20,000; owner, Francis J. Schnugg, 225 East Tenth St.; architect, J. Kastner.

East Fourth St., No. 235½, five-st'y brick tenement and store, tin roof; cost, $8,000; owner, Franz Suchy, 235 East Fourth St.; architect, Chas. Sturtzkober.

West Twentieth St., No. 229, five-st'y brick tenement, tin roof; cost, $15,000; owner, Wm. S. Wright, 36 West Twenty-seventh St.

Seventh Ave., w s, 25′ n Fifty-third St., four-st'y brick stable, tin roof; cost, $15,000; owner, Anthon Lana, 318 West Thirtieth St.; architects, Thom & Wilson.

Third Ave., s w cor. One Hundred and Twenty-eighth St., four-st'y brick tenement and store, tin roof; cost, $10,000; owner, Jacob Eblinq, on premises; arch tect, Julius Boekell.

North Brother Island, two-and-a-half-st'y brick dwell., slate roof; cost, $10,000; owner, City of New York (Department Board of Health, 301 Mott St.); architect, Chas. C. Haight, builder, Chas. Jones.

North Brother Island, two-st'y kitchen building, slate roof; cost, $16,000; owner and architect, same as last.

Second Ave., No. 2181; five-st'y brick tenement and store, tin roof; cost, $16,000; owner, Henry Klauber, 2180 Second Ave.; architect, John McIntyre.

Forty-ninth St., s s, 175′ w Eighth Ave., 7 five-st'y brown-stone front tenements, tin roofs; cost, each, $14,500; owners, James H. Havens, 418 West Fifty-fifth St., and Wm. Rankin, 338 West Forty-seventh St.; architect, M. Louis Ungrich.

One Hundred and Fifty-third St., n s, 175′ e Tenth Ave., three-st'y brown-stone front dwell., tin and slate roof; cost, $9,000; owner, Fred. W. James, 268 West Forty-second St.; architect, James E. Ware.

One Hundred and Thirtieth St., s s, 156′ e Seventh Ave., three-st'y brown-stone front dwell., tin roof; cost, $12,000; owner, Ella C. Earle, 601 Lexington Ave.; architect, James E. Ware.

St. Nicholas Ave., n w cor. One Hundred and Fifty-second St., 4 three-st'y brick dwells.; cost, corner, $12,000; others, each $11,000; owner, Chas. L. Fleming, 63 East Sixty-first St.; architect, Jas. E. Ware.

Cherry St., Nos. 396, 398 *and* 400, five-st'y brick brewery, tin roof; cost, $45,000; owner, Jas. Wallace, 55 West Thirty-eighth St.; architect, Gage Inslee.

Bowery, Nos. 222 *and* 224, five-st'y brick building, slate and tin roof; cost, $48,000; owner, Young Men's Christian Association, Twenty-third St., cor. Fourth Ave.; architect, Bradford L. Gilbert; builders, P. Tostevin's Sons and Patrick Walsh.

One Hundred and Twenty-third St., n s, and *One Hundred and Twenty-fourth St.*, s s, 425′ e Eighth Ave., 2 four-st'y brown-stone front tenements, tin roofs; cost, each, $14,000; owner, John J. Quinn, 347 Quincy St., Brooklyn; architects, Cleverdon & Putzel.

Ogden Ave., w s, 626′ 6″ n Union St., 4 two-st'y frame dwells., tin roofs; cost, each, $1,900; owner, Estate of Mary Craft, Wm. Venvill, agent, Mott Ave., cor. One Hundred and Sixty-fifth St.; builder, A. MacNally.

Grand Boulevard, s e cor. One Hundred and Thirtieth St., 4 four-st'y brick tenements, tin roofs; cost, each, $10,000; owner and builder, John Fullam, 103 East One Hundred and Twenty-first St.; architect, Wm. J. Merritt.

Tenth Ave., No. 326, five-st'y brick tenement and store, tin roof; cost, $12,000; owner, Estate of Richard Ray; lessee, D. Edward Seybel, 247 Fifth Ave.; architect, Bart. Walther; builder, Jonathan Hanson.

Tenth Ave., No. 328, five-st'y brick tenement and store, tin roof; cost, $14,000; owner, lessee, architect and builder, same as last.

Seventy-first St., s s, 60′ w Lexington Ave., 2 four-st'y brown-stone front dwells., tin roofs; cost, each, $2,000; owner, John Livingston, 981 Lexington Ave.; architect, F. T. Camp.

Ninety-first St., n s, 105′ e Park Ave., 4 three-st'y and basement brown-stone front dwells., tin roofs; cost, each, $10,000; owner, Susan Sullivan, 1365 Lexington Ave.

ALTERATIONS.—*Fifth Ave., No.* 3, three-st'y brick extension, slate and tin roof, front altered, etc.; cost, $20,000; owner, Benj. F. Dawson, on premises; architect, H. J. Hardenbergh; builders, J. Banta and J. L. Hamilton.

East Eighth St., No. 310, new store fronts and interior alterations; cost, $3,000; owner, Chas. Michling, 124 Second St.; architects, Berger & Baylies; builders, G. Staiger and Guy Culgin.

Bleecker St., No. 102, two st'y brick extension, tin roof; cost, $4,000; owner, Moritz H. Rosenstein, on premises; architect, Wm. Graul.

East Sixteenth St., No. 110, add one and one-half stories, also four-st'y brick extension, internal alterations; cost, $19,000; owner, V. Cassine King, 75 East Fifty-fifth St.; architects, Thom & Wilson; builders, M. Reid and Grissler & Fauael.

Lexington Ave., No. 266, three-st'y brick extension, tin roof, new windows, etc.; cost, $14,000; owner, Grace R. Miller, on premises; architect, H. E. Ficken.

One Hundred and Twenty-third St., Nos. 182 *and* 184, building moved and three-st'y brick extension, tin roof, also interior alterations; cost, $5,000; owner, Charlotte Bull, 184 East One Hundred and Twenty-third St.; architect, A. Spence.

West Thirty-fifth St., No. 33, two-st'y brick extension, tin roof; cost, about $5,000; owner, Fredein W. Stevens, 64 West Forty-ninth St.; architect, G. E. Harney; builders, J. J. Tucker and A. L. Casey.

Clinton St., No. 189, five-st'y brick extension, tin roof; cost, $7,000; owners, M. Schoenenpp and M. Goldberg, 31 Catharine St.; architect, Chas. Rentz.

West Twenty-eighth St., No. 103, two-st'y brick extension, tin roof; cost, $5,000 owner, Mary Taylor, on premises; architect, Ralph S. Townsend.

West Seventeenth St., No. 49, four-st'y brick extension, etc.; cost, $9,000; owner, Academy of the Sacred Heart, on premises; architect, T. H. Poole; builder, A. N. Gatchell.

Philadelphia.

CHURCH.—*Broad St.*, cor. Butler St. (Nicetown), there will be built a Roman Catholic church, 84′ x 142′, height of tower, 124′, to be built of granite and brick, with terra-cotta mouldings and Indiana limestone trimmings, with tile roof; from plans by Willis G. Hale, architect.

BUILDING PERMITS.—*Twenty-first St.*, cor. Locust St., 2 three-st'y dwells., 23′ x 44′; Geo. McNichols, contractor.

Twenty-first St., cor. Locust St., 2 three-st'y dwells., 21′ x 44′; Geo. McNichols, contractor.

North Seventh St., Nos. 1724 *and* 1726, 2 two-st'y dwells., 14′ x 46′; Owen McKenna, contractor.

Eighth St., cor. Filbert St., three-st'y store-building, 20′ x 86′; M. Meehain, contractor.

Frankford Ave., No. 2853, two-st'y hall-building, 20′ x 42′; R. Creiger, contractor.

Long Lane, cor Twenty-seventh St., one st'y still-building, 34′ x 40′; C. E. Johnston & Co., owners.

Fourth St., cor. Doye St., two-st'y stable, 30′ x 45′; Geo. C. Jackson, contractor.

Twenty-third St., cor. Turner St., three-st'y machine shop, 32′ x 53′; Jno. Braun, owner.

Frankford Ave., No. 2230, three-st'y dwell., 17′ 6″ x 30′; Robt. Beatty, contractor.

Queen Lane, w of Green St., two-st'y dwell., 18′ x 43′; Martin Heitzell, contractor.

Second St., n of Lehigh Ave., fire engine-house, 27′ x 60′; Thos. Cassady, contractor.

Baring St., e of Thirty-seventh St., three-st'y dwell., 20′ x 60′; F. H. Vogdes, superintendent.

Wreken St., w of Pepper St., 4 two-st'y dwells., 12′ x 34′; Thos. L. Kelly, owner.

Tacony St., n of Bridge St., 2 three-st'y dwells., 18′ x 50′; Bloucher & Schoch, contractors.

Orthodox St., e of Mulberry St., two-st'y store and dwell., 16′ x 50′; Bloucher & Schoch, contractors.

Washington Ave., e of Twenty-third St., three-st'y addition to cooperage, 96′ x 130′; Thos. Little & Son, contractors.

Rodman St., e of Tenth St., three-st'y factory, 32′ x 32′; Thos. Little & Son, contractors.

Main St., below Shur's Lane, one-st'y dye-house, 35′ x 60′; Richard Hey, owner.

Sixteenth St., n of Jefferson St., three-st'y dwell., 40′ x 72′; J. B. Doyle, contractor.

Twelfth St., cor. McKean St., two-st'y dwell., 18′ x 40′; Thos. O. Malley, owner.

Terrace St., bet. Seville and Adams Sts., three-st'y dwell., 17′ x 47′; Jas. H. Boone, contractor.

Fifteenth St., s of Montgomery Ave., 10 three-st'y dwells., 18′ x 70′; C. M. Baker, contractor.

Mt. Airy Ave., cor. Somerset St., three-st'y dwell., 28′ x 32′; Jno. Wallace, owner.

Nevada St., bet. Eleventh and Twelfth Sts., two-st'y dwell., 17′ x 46′; S. Stewart, contractor.

Chestnut St., w of Thirty-third St., two-st'y church, 86′ x 109′; Jno. A. Decker, contractor.

Delhi St., n of Susquehanna Ave., two-st'y dwell., 16′ x 45′; Jno. Weible, owner.

South Eighth St., No. 1704, two-st'y dwell., 16′ x 42′; H. C. Mintzer, owner.

St. Louis.

BUILDING PERMITS.—One hundred and four permits have been issued since our last report, fifty-two of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows, viz.:—

W. Koopman, 2 adjoining two-st'y brick dwells.; cost, $5,600; H. E. Pelpers, architect; Remmers & Thompson, contractors.

—— Barry, two-st'y brick dwell.; cost, $3,300; C. H. Aufderheion, contractor.

Dr. Chas. Garcia, 3 two-st'y brick mansard roof stores and offices above; cost, $13,000; J. J. Stenen, contractor.

Gregory, Roche & Mentana Casino Co., brick theatre or concert-room; cost, $4,000; I. Taylor, architect; Bergan Bros., contractors.

M. E. Green, double brick dwell.; cost, $5,000; I. Taylor, architect; W. Green, contractor.

G. J. Fritz, brick addition to workshop; cost, $4,000.

James Layton, two-st'y brick dwell.; cost, $5,000; Chas. E. Illsley, architect; Barnett & Duffner, contractors.

James Layton, two-st'y brick dwell.; cost, $5,000; Chas. E. Illsley, architect; Barnett & Duffner, contractors.

St. Louis Stamping Co., four-st'y brick addition to warehouse; cost, $7,000; Aug. Beinke, architect and contractor.

J. G. Rubbelman, 2 adjacent two-st'y brick dwells.; cost, $6,000; Aug. Beinke, architect; S. H. Schaffner, contractor.

St. Louis Gaslight Co., two-st'y brick Purifying-room; cost, $7,000; sub-let.

General Notes.

KANSAS CITY, MO.—M. E. Church South, wood church, n e cor. Missouri Ave. and Campbell St.; 54′ x 70′, two-st'y; cost, $6,000.

James W. Wood, addition and general repairs to a block of buildings at 109, 111, and 113 West Ninth St.; cost, $5,000.

Walter B. Lee, 2 houses, each 30′ front, and 65′ in depth, and two-st'y high; cost, $10,000 each.

Anheuser-Busch Brewery Company, brick barn at the n e cor. of Twentieth and Walnut Sts.; cost, $4,500.

MILWAUKEE, WIS.—Granite monument 30′ high, to be erected in Forest Home Cemetery, to the 100 victims of the Newhall House fire; Henry O. Avery, architect, New York.

Wm. Franzen, dwell., on State St., cor. Fifteenth St., Second Ward; cost, $2,500.

Mr. Van Ewick, frame building on Harmon St., Sixth Ward; cost, $4,000.

Mrs. E. F. Pratt, brick house on Astor St., Seventh Ward,

Mrs. Downer, dwell. on Prospect Ave., First Ward, cost, $7,000.

SPRINGFIELD, O.—Wittenberg College, is to have a new $10,000 theological hall.

Efforts will be made by Springfield citizens to have the new intermediate penitentiary located in this city.

TOWNSEND, MASS.—Orthodox Congregationalist Church edifice in this place, is to undergo an extensive remodelling, under the architectural supervision of Silloway & McKay, of Boston. A similar work is in process by them on the Bunker Hill Baptist church edifice at Charlestown, Mass.

Publishers' Department.

The American Architect and Building News.

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☞ Payment should be made *directly* to the publishers, either by draft or post-office order.

New Advertisements.

NEWELL UNIVERSAL MILL CO. (New York, N. Y.), Heating Apparatus. Page vii.
HEALD & MORRIS (Baldwinsville, N. Y.), Engines. Page ix.

COMPETITION.

PUBLIC LIBRARY BUILDING.
[At Boston, Mass.]

The Committee on Public Library, having been authorized to procure plans for a new public library building, to be erected on the lot bounded by Dartmouth Street, St. James Avenue and Boylston Street, and being desirous of interesting architects to produce the best plan for the same, hereby offer four premiums of $4,000, $3,000, $2,000, and $1,000, respectively, to the authors of the four best designs, according to the order of their merit.

The plans for which premiums are awarded will become the property of the city, with the right to use the whole or any part, or any modification thereof, without further claim from the authors for compensation or employment.

All designs must be sent to the Trustees of the Public Library on or **before August 1, 1884.**

Further particulars may be had by applying to William H. Lee, Clerk of Committees, City-Hall.

For the Committee,
CHARLES V. WHITTEN,
446* Chairman.

PROPOSALS

HOUSE OF CORRECTION ALTERATIONS.
[At Plymouth, Mass.]

Sealed proposals will be received **until noon, Friday, July 18th, 1884,** at the office of the County Commissioners, Court-House, Plymouth, for the additions and alterations to the House of Correction.

Plans and specifications of the work may be seen on and after Monday July 14th, at the office of J. Williams Beal, Architect, 7 Exchange Place, Boston, or at the office of the County Commissioners.

CHARLES H. PAINE,
JEDEDIAH DWELLEY,
WALTER H. FAUNCE,
} County Commissioners.

HOSPITAL EXTENSION.
[At Middletown, Conn.]

Sealed proposals will be received **until Wednesday, the 16th inst., at 10 o'clock,** for the carpenter work of the proposed new hospital extension at Middletown, Conn., according to the plans and specifications to be seen at the hospital.

The contractor to enter into obligation to have the building inclosed, and to have it finished within specified dates, which dates he is to specify, and to furnish good and sufficient bonds for the faithful performance of the work.

The committee reserve the right to reject any or all bids not in the interest of the State. Address

SECRETARY BUILDING COMMITTEE,
446 Hospital for Insane, Middletown, Conn.

PIERS AND BULKHEADS.
[At New York, N. Y.]

The following mentioned proposals will be received by the Department of Docks, 117 and 119 Duane St., **until Wednesday, July 16th, at 12 o'clock,** M.

1st. Proposals for repairing piers at Bethune, Jane, Horatio, and north of Bloomfield Sts., North River.

2d. Proposals for building bulkhead platform at foot of One Hundred and Fifth and One Hundred and Sixth Sts., Harlem River.

3d. Proposals for repairing the northerly half of Pier Old 34, North River.

4th. Proposals for building a crib bulkhead from One Hundred and Twenty-Ninth to One Hundred and Tuirtieth Sts., North River.

5th. Proposals for dredging at the pier at Seventeenth St., North River, and other places.

For full information see the *City Record;* copies for sale at No. 2 City Hall.

446

WANTED.

SITUATION.—A draughtsman of over four years' experience desires an engagement. References if desired. A. F. W., 223 Swan St. Buffalo, N.Y. 446

WANTED.

SITUATION.—Situation in an architect's office, where there is a chance to learn, by young man of steady habits; understands something of practical carpentry and lineal drawing to scale, and in perspective. Northern States preferred. Address G. H. W., Box 63, Tower City, Dak. 446*

WANTED.

Back Numbers of the American Architect.

We shall be under obligations to any one who can furnish us with the following copies of the *American Architect:*—

No. 215, February 7, 1880.

For this number we will pay 50 cents per copy.

PROPOSALS.

STABLE.
[At Athol, Mass.]

Sealed proposals will be received **up to noon, July 15, 1884,** for building a stable and office-building for the Springfield Coöperative Milk Association.

Plans and specifications may be consulted at the office of J. M. Currier, Architect, Room 18, Athol Depot Block.

We reserve the right to accept or reject any or all bids. C. S. ALLEN, Pres.

SCHOOL-HOUSE.
[At Cheviot, O.]

Sealed proposals will be received at the office of Edward C. Reemelin, No. 49 West Third St., Cincinnati, O., **until 12 o'clock,** M., **of the 4th day of August, 1884,** for the erection and entire completion of a one-st'y addition to the school-house of Special School District, No 1, at Cheviot, O., according to the plans and specifications on file at said office. All bids to conform to the requirements of Section 3988 of the Revised Statues of Ohio. The Board reserves the right to reject any or all bids.

448 EDWARD C. REEMELIN, Clerk.

PROPOSALS FOR LABOR AND MATERIALS.
[At Baltimore, Md.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., July 8, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 13th day of August, 1884,** for all the labor, bricks, cement, lime, and sand, and terra-cotta flue-lining required to complete the walls of the superstructure of the Post-Office, etc., at Baltimore, Md., in accordance with drawings and specification which may be seen, and any additional information obtained on application at this office, or the office of the Superintendent on and after the 16th instant.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
447* Supervising Architect.

COURT-HOUSE.
[At Cincinnati, O.]

OFFICE OF BOARD OF TRUSTEES TO REBUILD COURT-HOUSE.

Sealed proposals will be received at the office of the Board of Trustees to rebuild Court-House, Room 10, Debolt Building, **until 12 o'clock,** M., **on Friday, July 18, 1884,** for the following work in cellar.

Excavation.
Masonry.
Dressed-Stone.
Brickwork.

The proposals must be made on the blanks that will be furnished on demand by said Board. No others will be considered.

The plans and specifications can be seen at the office of James W. McLaughlin, Architect, Nos. 46 and 47 Johnstone Building.

By order of the Board.
446 J. CLIFFORD GOULD, Clerk.

COURT-HOUSE AND JAIL.
[At Pittsburgh, Pa.]

CONTROLLER'S OFFICE, ALLEGHENY CO., PITTSBURGH, PA., June 26, 1884.

Sealed proposals for the erection of a court-house and jail at Pittsburg, Allegheny County, Pa., will be received at this office by the controller, **until 3 o'clock,** P. M., **of August 16, 1884.**

All proposals must be made in accordance with the plan and specification prepared by H. H. Richardson, architect, which will be open for examination at the office of the County Commissioners, on and after the first Monday of July.

All proposals must be made on blanks furnished by the architect on application at the aforesaid commissioners' office.

The contract will be awarded to the lowest and best bidder upon giving to the county a good and sufficient bond in the sum of five hundred thousand dollars ($500,000), with approved securities for the faithful performance of the work.

All bids must be accompanied with an approved bidder's bond in the sum of one hundred thousand dollars ($100,000).

The commissioners reserve the right to reject any and all bids. JOSEPH SPEER,
449 Controller of Allegheny County.

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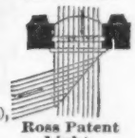

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PROPOSALS.

BRIDGE MASONRY.
[At Columbia, O.]

COUNTY AUDITOR'S OFFICE, HAMILTON COUNTY, OHIO, CINCINNATI, June 17, 1884.

Sealed proposals will be received at the office of the County Commissioners **until Wednesday, July 16, 1884, at 12 o'clock,** M.

For the masonry and approaches to a bridge over Duck Creek, on the road from Red Bank to Madisonville, in Columbia Township.

To be built according to plans and specifications now on file in County Commissioners' office.

The Commissioners reserve the right to reject any or all bids.

By order of the Board of County Commissioners.
JOSEPH W. BREWSTER,
446 County Auditor.

IRON BRIDGE.
[At Columbia, O.]

COUNTY AUDITOR'S OFFICE, HAMILTON COUNTY, OHIO, CINCINNATI, June 17, 1884.

Sealed proposals will be received at the office of the County Commissioners **until Wednesday, July 16, 1884, at 12 o'clock** M., for an iron superstructure over Duck Creek, on the road from Red Bank to Madisonville, in Columbia Township.

To consist of one span of 70 feet, with clear roadway of 20 feet.

To be built according to plans and specifications on file in County Commissioners' office.

The Commissioners reserve the right to reject any or all bids.

By order of the Board of County Commissioners.
JOSEPH W. BREWSTER,
416 County Auditor.

PLASTERING.
[At Kansas City, Mo.]

OFFICE OF SUPERVISING ARCHITECT, TREASURY DEPARTMENT, WASHINGTON, D. C., June 26, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 17th day of July, 1884,** for all the plastering required in the custom-house and post-office building at Kansas City, Mo., in accordance with drawings and specifications, copies of which and any additional information may be had on application at this office or the office of the Superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
446* Supervising Architect.

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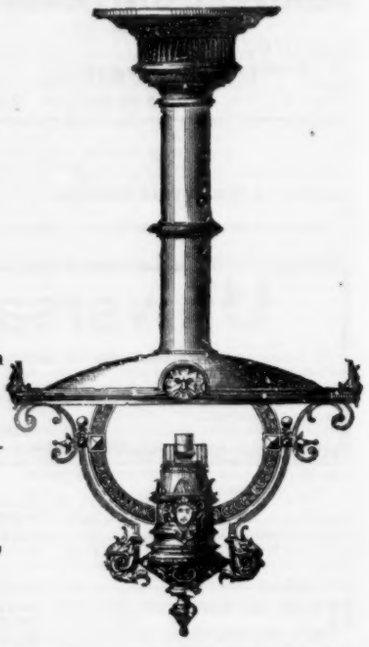

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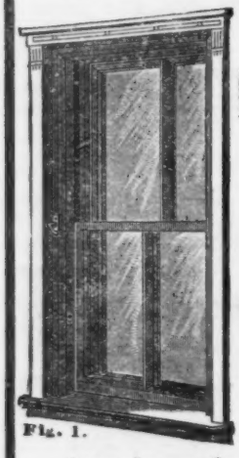

Fig. 1.—Interior view of window, with ATTWELL LOCK applied, the key-head and escutcheon being alone visible.

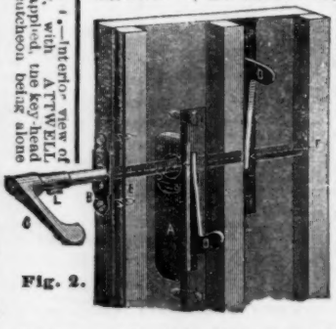

Fig. 2.

Fig 2.—Sectional view of frame at left of meeting-rails of sash, showing Locks A A mortised into frame on right and left of parting-bead. B, the Escutcheon, located over keyhole in reveal of frame. C, the REMOVABLE Key, controlling from the ONE POINT THE TWO LOCKS A A D D, the Bolts of Locks, one controlling each sash, operated separately, but working in combination. L, a lug on key, used in operating "shut off"—*i. e.*, holding, at pleasure, either bolt out of engagement with "strike."

Fig. 3.

Fig. 3.—Section of sash showing location and application of "strike." This "strike" gives four locking or ventilating points to each sash within a radius of safety from the admission of the thief's body.

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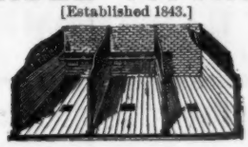

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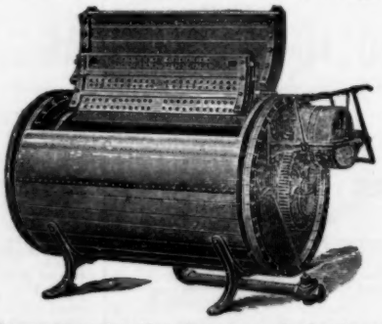
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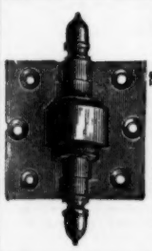

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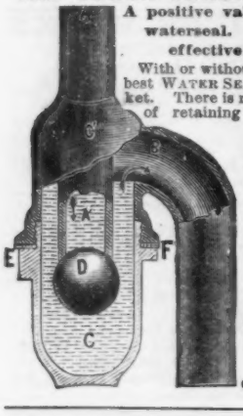

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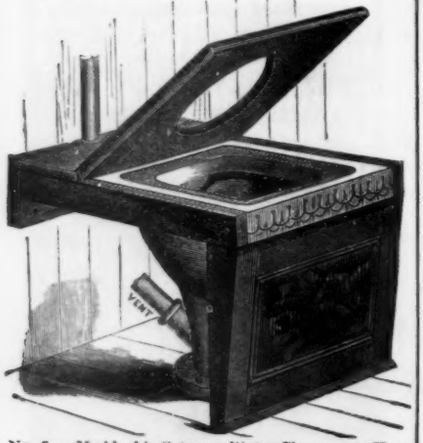

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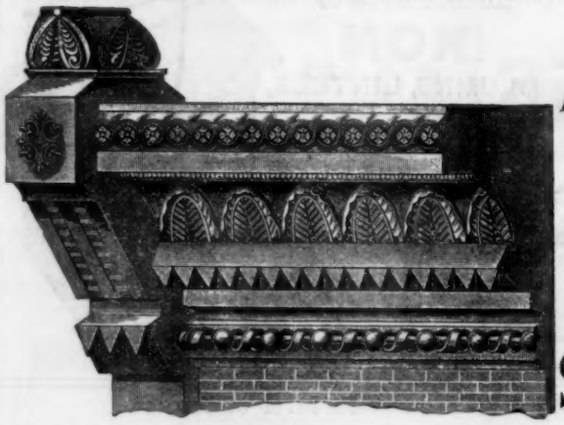

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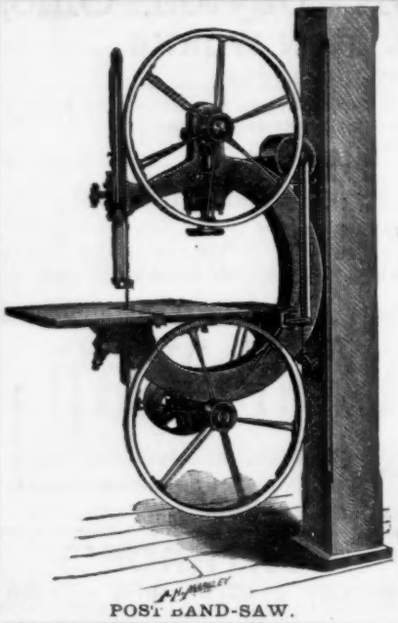

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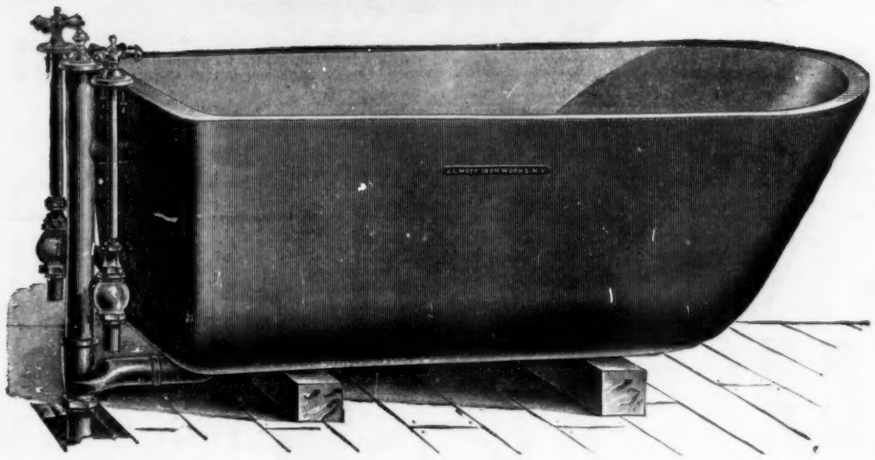

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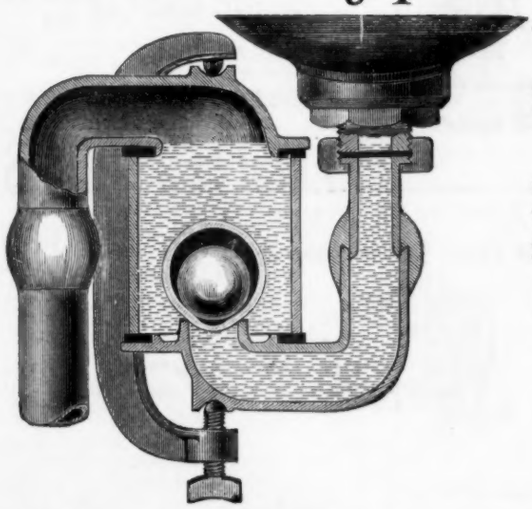

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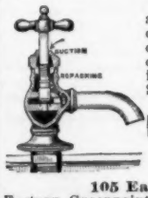

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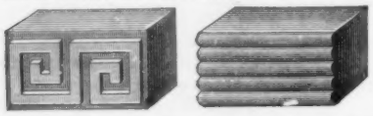

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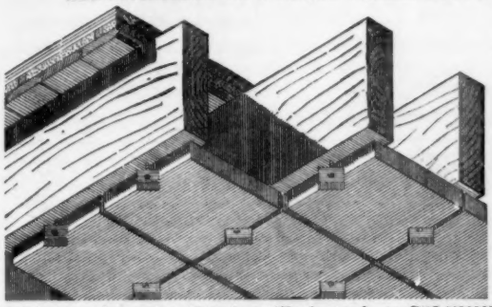

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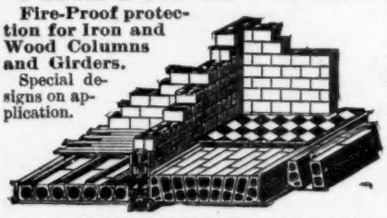

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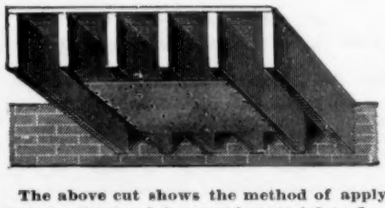

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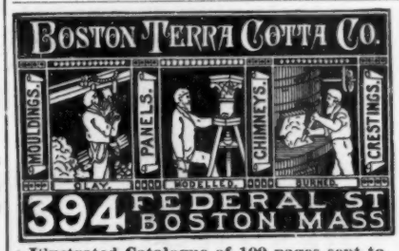

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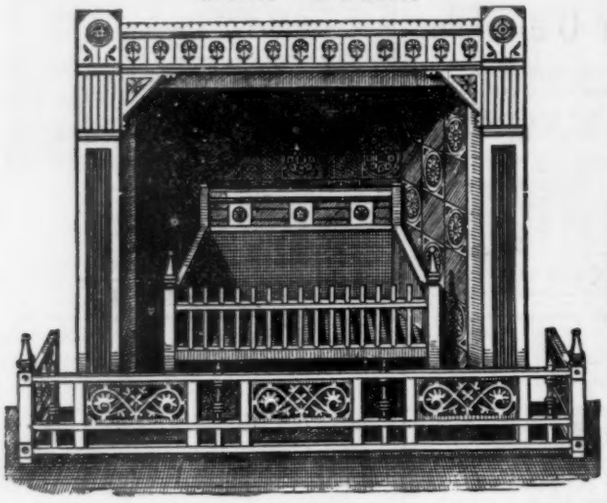

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